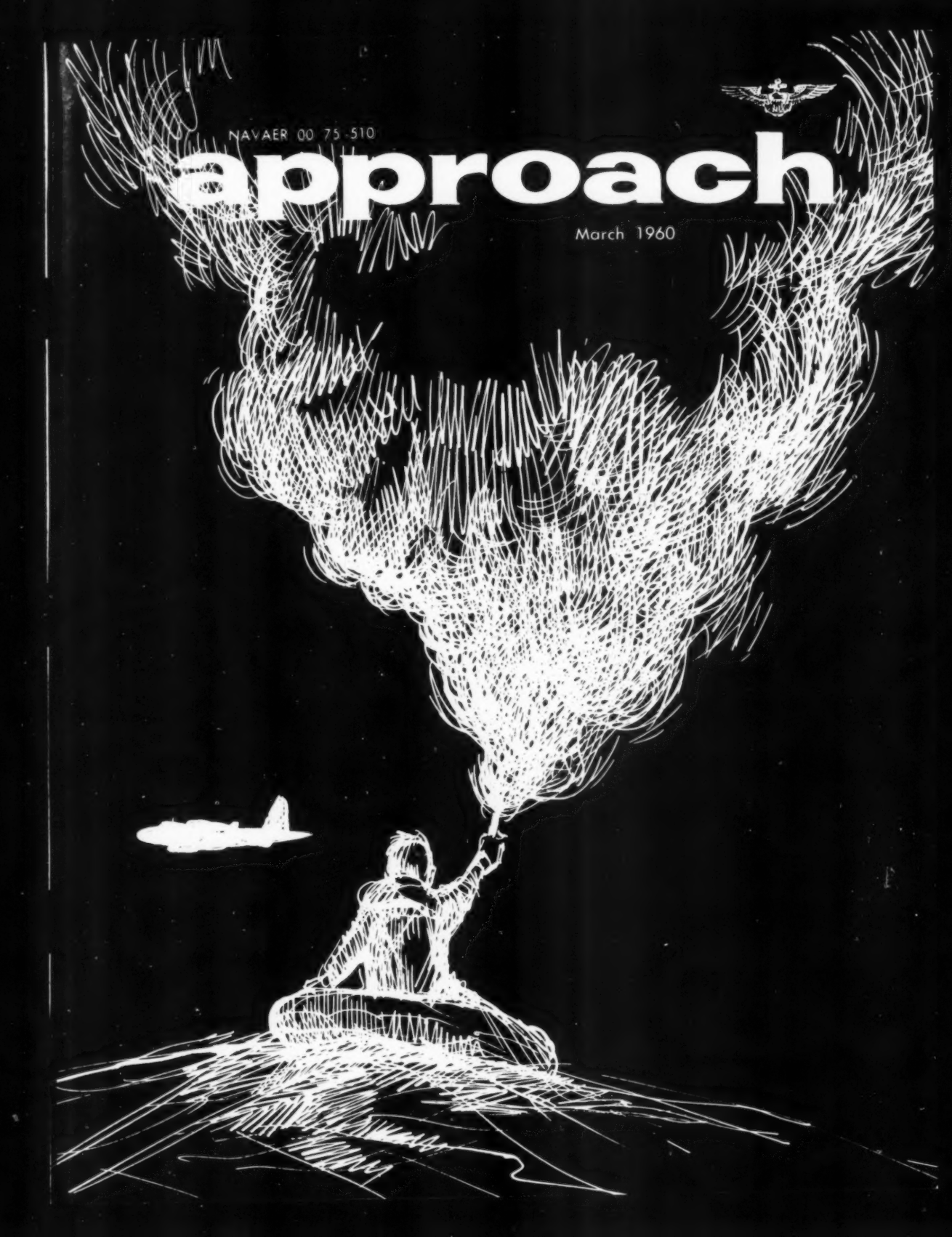
NAVAER 00 75-510
approach
March 1960

PROSPECTUS

1959-1960

THE December aircraft accident rate of 1.6 is the lowest on record and closes out the first six months of FY 60 with a All-Navy rate of 2.0. This is a 27 percent improvement over the first half of FY 59 and is an accomplishment of which the Navy and Marine Corps can well be proud. During this same period the fatal rate and strike rate improved 14 percent and 26 percent respectively. The greatest improvement was in carrier operations with a rate drop of 40 percent. However, during the past 6 months the material failure rate of carrier embarked units has been 2½ times that ashore, with engines and landing gear being the principal offenders. Personnel error other than pilot was involved in 4½ times as many accidents embarked as disembarked.

Midair collisions have doubled with all but one being with aircraft of the same flight. Five air craft were struck by projectiles. High loss of life and constantly mounting cost of aircraft make it mandatory that accidents be reduced much further. Our attainments, which have exceeded past concepts of the possible, indicate that we can repeat can realistically expect to reach nearly zero and to do it soon. It is expected that all addressees will continue to take aggressive action to this end. Specifically: Focus more attention on aircraft maintenance with particular emphasis on careful inspections. Improve aircraft handling and control procedures aboard and ashore. Demand strict adherence to doctrine and SOP. Insist on observance of highest standards of command and personal discipline. Take positive steps to reveal any personnel culpabity or incompetence and take appropriate disciplinary action. Ensure complete understanding and application of the principles outlined in NASC Pamphlet entitled "Final Approach." Increase stabilization in personnel assignments. Accelerate identification of material defects, and incorporation of remedial aircraft service changes. Improve supervision at all levels of command with attention to details.—*CNO Message 082004 of Jan '60*

Copies of this NASC special report on landing technique for high performance aircraft have been previously distributed to the fleet. Extra copies are available in limited quantity on request to NASC.

In This Issue

. . . Then the Fun Began
Applied Mathemagics
Speak Up
Noise Abatement (Anymouse)
Headmouse
Terminal Trance
The Overhead Break
'By the Deep, Fifty!'
Monitor
RAPEC
Helo Hoist
Notes From Your Flight Surgeon
Safe Handling With Hot Brakes
Trouble-Shooting the J65-TJL2 Fuel Control
Tow Bar Troubles
Fit To Be Tied
FOD Major Threat
Murphy's Law
Please Be Seated

Published by U.S. Naval Aviation Safety Center
NAS, Norfolk 11, Va.

RADM William O. Burch, Jr.
Commander, Naval Aviation Safety Cen

CDR Herman Evans, Jr.
Head, Literature Department

Editor, A. B. Young, Jr.

Managing Editor, LCDR W. J. Thomas

Associate Editors:
LCDR J. M. Wondergem, LCDR D. M. Hu
LT W. B. Kennedy, J. T. LeBarron, JOC
J. C. Kiriluk, Julia Bristow

Art Director, R. B. Trotter

Illustrator, T. W. Healy, ALC

Photographer, J. E. Williams, Ph 1

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Letters

Somebody Goo₊ed

Sir:

Ref December issue APPROACH magazine, page 47. "IF A MOTTO CAN BE PRINTED WRONG, SOMEONE WILL PRINT IT THAT WAY," what happened to the word "can?"

ANYMOUSE

● **Grog rations of the printer's devil have been cut as a consequence. "Murphy's Law" should read: "If an aircraft part can be installed incorrectly, someone will install it that way!"**

Ill Wind

Sir:

It was a beautiful day in sunny Bermuda until we happened to pick up a December copy of APPROACH and discovered in your Christmas shopping list a present of swells into the wind for P-Boat Pilots.

As members, in good standing, of the P-Boat PPCs Club we would appreciate our winds 90 degrees out of the swell.

SMITH, MC GEHEE and CHECK

● **For clarity we should have said "lined up with or running perpendicular to the wind, instead of with the wind."**

On Foaming Runways

Sir:

We would like to heartily congratulate you and your authors for the excellent and valuable research and story job you have done on the Emergency Landing-Foamed Runway problem. The presentation of facts learned via the field experience route has been needing to be told but we were at a loss as to how to even begin . . .

It appears to us that the information you have uncovered, written primarily from the pilots' point of view, complements, strengthens and fills in the holes in our attempts at providing a picture of the foamed runway situation as it now stands. We and many others concerned with aviation safety are much indebted to you for taking this forward step.

Your article will be very important to many areas, even in international civilian air circles, who are now weighing the problem of runway foaming . . .

RICHARD L. TUVE, Code 6220
Head, Engineering Branch
U.S.N. Research Laboratory
Washington, D.C.

Wheels Sign

Sir:

Reading the Weekly Summary for 7-13 Dec '59 I noted the TV-2 accident in which the aircraft struck the "wheels" sign.

The number of upright signs showing up alongside roadways has been a source of increasing concern to me.

In the case of the "wheels" sign, it seems to me this could be painted on the runway much like road signs are and one upright could be eliminated. Possibly this could be tried for other signs, too and the field surface thereby cleared of some obstructions.

G. E. CLARK, LCDR
NAS South Weymouth

● **Agree that no obstructions above the field surface would be ideal. However, painting "WHEELS" on the runway surface might involve problems. There are already too many "necessary" markings on the runway surface, and adding another would only add to the confusion—to say nothing of the difficulty of keeping it free from tire marks. Another problem is readability—you could read the word real fine at the break, but WHEELS is supposed to be a sock-**

VOLUME 5 APPROACH—THE NAVAL AVIATION SAFETY REVIEW NUMBER 89

Purposes and Policies: APPROACH is published monthly by the U.S. Naval Aviation Safety Center and is distributed to naval aeronautical organizations on the basis of 1 copy per 12 persons. It presents the most accurate information currently available on the subject of aviation accident prevention. Contents should not be construed as regulations, orders, or directives. Material extracted from Aircraft Accident Reports (OpNavs 3750-1 and 3750-10), Medical Officer's Reports (OpNav 3750-8) and Anymouse (anonymous) Reports may not be construed as incriminating under Art. 31, UCMJ. Photos: Official Navy or as credited.

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Correspondence: Contributions are welcome as are comments and criticisms. Views expressed in guest-written articles are not necessarily those of NASC. Requests for distribution changes should be directed to NASC, NAS Norfolk 11, Va., Att: Literature Dep't.

Printing: Printing of this publication approved by the Director of the Bureau of the Budget, 31 Dec 1957.

Subscriptions: Single copy 30 cents; 1-year subscription $3.25; 75 cents additional for foreign mailing. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Library of Congress Catalog No. 57-60020.

you-in-the-face last-moment reminder on final approach, and it would be hard to read on final, at your low altitude and angle of sight. Like the POMOLA, the WHEELS sign should be just a bit stronger than a bushel basket. Then all we'll need is for pilots to land on the runway!

It's Standing Operating Procedures

Sir:

With reference to your January issue . . . where did you get the term "*Standing* Operating Procedures"? I've been accustomed to hearing it called "*Standard* . . . " and it sounds more logical to me. Everyone whom I've asked has replied Standard—so how come?

STANDARD MOUSE

● ***Standard*** **has been pretty commonly used but technically it's as incorrect as saying "GCA Approach" or "IFR rules." For the correct definition of SOP we refer you to the Dictionary of U.S. Military Terms for Joint Usage, OpNavInst 3020.1A, which says, " . . .** ***standing operating procedure*** **(SOP)—A set of instructions covering those features of operations which lend themselves to a definite or standardized procedure without loss of effectiveness . . . "**

Communication Confusion

Sir:

ANYMOUSE's letter in the December issue of APPROACH concerning frequency shifting just before intercepting the glide path jogged my memory of a similar, though different, incident which also happened to me at an AFB. The difference was that there was no frequency shift prior to touchdown (Good) but there were two different aircraft being brought in at the same time on the same frequency (Bad).

This occurred while in the soup at about 1200'. The other aircraft (multi-engine) was given a turn, which was taken by my student (and me!) as being for us. Reason for confusion—same last two numbers of the BuNo. I immediately told the controller to use my side number, and after corkscrewing around through the soup, we landed without further incident.

Is this use of the same frequency for two aircraft common practice in the Air Force? If so, it seems to me that an unnecessary additional confusion factor is being added to GCA. I was in a jet and the other plane was a C-130 some distance behind me, so no near-miss was involved, but this sort of thing could get hairy!

LT, USN

Kingsville

Terminology for Air Refueling

Sir:

The November issue of APPROACH commented upon the growing use of the term IFR for inflight refueling and the possibility of confusion with the long-standing accepted meaning of IFR. The Bureau of Naval Weapons uses and has promoted the term *air refueling* as defined in Spec MIL-A-19736(Aer).

The general acceptance and use of the term, Air Refueling, or AR, might well reduce the ambiguity of the IFR term.

CHIEF, BUWEPS

Barracuda Not Attracted

Sir:

We have heard that while shark chaser will actually repel sharks, it tends to attract barracuda, who also have many sharp teeth! . . . Can you give us any information, pro or con, on this?

R. L. MC LAUGHLIN
Douglas Aircraft Co., Inc.

● **We have no record of barracuda being attracted by shark chaser—and there are good reasons to doubt that they would be. Barracuda are normally attracted by bright, flashing objects. The dark cloud produced by shark chaser would, if anything, reduce the reflections from such objects. Captain William Gray, Director of Collections and Exhibits at the Miami Seaquarium, has said that the possibility of attack by barracuda is negligible.**

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. Views expressed are those of the writers and do not imply endorsement by the U.S. Naval Aviation Safety Center.

Crash Rescue

Sir:

With reference to Commander Sparks' letter December APPROACH, we here at MCAS Kaneohe have gone a few steps further. We have compiled two separate 8 x 10½ notebooks on all Marine Corps, Navy, Air Force and Army aircraft presently in service. The notebooks are marked on the edge indicating the branch of service. These books are carried in our Rescue Truck in the glove compartment where they are readily available in case of emergency. We compiled this information through the cooperation of leading aircraft companies, too numerous to mention here. We also utilized sections from NavAer 0080R-14 to further complete our information.

One shortcoming we have noticed in most of the publications made available to us was the lack of sling host points and the type of slings to be used. We hope this may be of further assistance to other crash crews, since the information may be secured on most aircraft from the manufacturer.

WILLIAM F. FESTING, JR.
AGySgt USMC

Over, Not Under

Sir:

There seems to be much controversy on the matter of the correct way to wear the cutaway anti-G suit. Throughout my career I have heard that it is best to wear it inside the cotton flight suit, and I have also heard that it is to be worn outside.

I have rather strong convictions favoring the wearing of the anti-G suit over my flight suit. If I am right, I would appreciate some ammunition to use upon those who insist that it be worn the other way. It seems to me that the manner of its wearing should be at the pilot's discretion, since it is for the pilot's welfare.

JIM HAGAN, 1ST LT, USMCR
VCMJ-3

● **Your ammunition is Clothing**

and Survival Equipment Bulletin (BACSEB) No. 23-57, which recommends that the Z-3 cutaway anti-G suit be worn *over* the summer flight suit. As for the pilot's option, you may be morally correct, but the pilot's welfare is part of the Navy's combat readiness and he's risking more than his own personal welfare when he uses equipment in the wrong manner.

Time Index

Sir:

Here's an idea that might be of assistance to forgetful types: and aren't we all occasionally?

Problem—On many occasions the pilot is required to remember a specific *Time*—be it time for an expected approach or other instruction from ATC, for a fuel consumption check, for an ETA at an intersection or a non-mandatory checkpoint, *ad infinitum*.

Solution—A manually operated index that moves about the perimeter of the clock face, easily set by the pilot for any minute of the hour that he doesn't want to trust to his overloaded memory system or transcribe onto his overloaded knee pad.

R. A. NEWCOMB
Commander, USN

NAS Corpus

Chowline

Sir:

A couple of years ago your publications started a crusade to improve eating facilities of the flight line for both transient pilots and duty pilots flying at other than standard meal time.

This campaign has paid off and now you can go to most any Navy or Marine Corps station and get some acceptable food in some reasonable manner.

However, this very convenience is now on the way to producing another problem. The Ops people, line crews, miscellaneous duty crews and desk jockeys on separate rations are finding this a convenient snack bar. Thus our intrepid aviator arrives at NAS GOTNOMO just in time to become tail-end Charlie to a long line, not that we aviators are prima donnas but it is sometimes frustrating to have to choose between a quick hot meal and a weather expiration.

Apparently this problem has come up at several places for I've noticed a few bases which have installed large signs near the cash register. These generally say "Flight crews in flight gear may go to the head of the line." This seems to be one answer to the problem, and should minimize the dirty looks when the aviator goes to the head of the line . . .

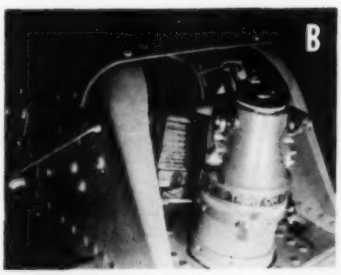
MARINE MAJOR

Taking Ejection Seats For Granted!

Sir:

Although ejection seats have been around for a long time and have more than proved themselves as reliable life-savers, they still should not be taken for granted. It was proven in our squadron recently that this can happen.

As one of our pilots was preflighting his F11F-1 *Tiger*, he noticed that something didn't look right with the firing cable in his ejection seat. The firing cable, (photo A), was coming from the



bottom of the face curtain roller rather than at the top (photo B). As a second check, he looked in the firing cable inspection hole on the starboard side of the headrest, and could not see the cable.

After downing the aircraft, a closer inspection was made. The following are the "not-very-pleasing" results. Nine hops previous, this aircraft came out of check, apparently with the firing cable rigged backwards on the face curtain roller. If the curtain had been pulled, the cable merely would have become slack, and the seat would not have fired. One parachute rigger installed the seat during the check and another more qualified rigger signed it off as being satisfactory. The aircraft was preflighted for nine hops by the plane captains and by six different pilots. It was the seventh pilot who finally caught the discrepancy.

This has happened before in other squadrons and will undoubtedly happen again unless every man from the pilot on down treats this ejection seat as an invaluable life-saver that is *never* to be taken for granted.

ROBERT H. ZIEGLER
ASO

San Diego

Approach Quiz

Should the Z-3 cutaway anti-G suit be worn *over* or *under* the summer flight suit? Page 2

What's the rule about operation of rotating beacons while on the ground? Page 27

How does it feel to be "keel-hauled" in an A4D? Page 24

How many major aircraft accidents in fiscal year 1959 had pilot factors involved? Page 8

What did the AD pilot do when his destination weather was reported as "indefinite zero, ¼ mile"? Page 20

What is the cost of overhauling an engine that has experienced Foreign Object Damage? Page 46

What would you do if you found a RAPEC in your A4D? Page 28

...THEN THE FU BEGAN

"THE arrestment and runout appeared normal. Then the fun began . . ."

The A3D with a crew of three had been launched from the carrier at approximately 2000 for CCA practice. Recovery was scheduled at 2030. The weather was clear above with scattered low clouds. Visibility was 10 miles. The air temperature was 70°F., water temperature 78°. Five-foot waves rolled across the ocean surface.

Under positive control of CCA, the pilot made three CCA penetrations to a waveoff before being cleared for a CCA penetration to a landing. On the fourth pass for a landing aboard, the aircraft appeared to be in good shape, on speed, on glide slope and lined up on center line until just prior to touchdown. (The LSO was handicapped in determining wing position because the aircraft's port wing light was out.) The mirror was working properly. The pilot experienced no difficulty with the brilliance of the deck runway lights.

At this point, the pilot, detecting a left drift, attempted to correct the situation. Before his corrections could become effective, however, the aircraft engaged the No. 4 cross-deck pendant.

As the pilot said later, "The arrestment and runout appeared normal. Then the fun began . . ."

On runout, the aircraft tracked from starboard to port. At completion of the runout, the plane hesitated momentarily, then slowly went over the port side . . . paused . . . then became inverted . . . and paused again. The arresting wire parted. Dislodging several life rafts stowed in bins, the A3D dropped into the water inverted and in a slightly nose-down attitude.

Water rushed through the open upper escape hatch into the dark cockpit. The pilot released his safety belt and discarded his APH-5 helmet and oxygen mask. He rose to the floor of the aircraft to take several deep breaths of the trapped air he knew would be there, then submerged to search for the bombardier-navigator and gunner-navigator. He found no one. After returning to the air space for a few more breaths, he dived down and out through the open hatch. He surfaced alongside the fuselage on the starboard side.

Meanwhile, the gunner-naviga-

tor had escaped through the canopy above his seat where the plexiglass had broken out on impact. He surfaced near the wing tip, inflated his life vest and looked around to see if anyone else had gotten out. Moments later, the pilot surfaced nearby.

Pilot Inflates Life Vest

When the pilot inflated his Mark 2 life vest, tears in the outer flotation cell allowed some of the CO_2 to escape. Holding on to the gunner-navigator, he inflated the center flotation cell orally. The men then crawled onto the wing to rest and plan their next move. They shouted the bombardier-navigator's name several times but there was no answer.

Although they could see two plane guard destroyers lying dead in the water with their searchlights working the area, the survivors did not fire signal flares because of the strong smell of fuel around the crash area. They decided to get away from the aircraft and to swim toward the closer destroyer. After blowing some more air in their life vests, they jumped off the aft edge of the wing and swam toward the ship. The gunner-navigator blew his whistle and the pilot waved a life vest flashlight. A few minutes later, they were picked up 100 yards from the wreckage by a motor whaleboat from the destroyer. They had been in the water 14 minutes.

Whaleboat Circles Wreckage

Following the pick-up, the whaleboat circled the aircraft wreckage twice in a search for the third crewman. As the boat headed away from the plane, in the distance the occupants saw a small light intermittently some 1000 yards from the wreckage. Drawing nearer, they heard a whistle, then were able to make out the figure of the bombardier-navigator from the light reflected off his orange summer flight suit. As they got closer they saw he was sitting in the middle of an inflated life raft—one of the rafts the A3D had knocked off the carrier as it went over the side.

At approximately 2335, the bombardier-navigator was pulled aboard the whaleboat. The signalman signaled the plane guard destroyer that all survivors had been rescued and 10 minutes later, the whaleboat was hoisted aboard.

The gunner-navigator and the bombardier-navigator suffered only minor bruises and cuts in the crash. The pilot sustained a moderately severe injury of the right hand requiring several months' grounding.

Survival Training Important

Survival training played a significant part in the crewmen's escape from the aircraft. "Thorough indoctrination in escape from the A3D inverted in the water was conducted in the parent squadron," the AAR states. "The results of this training are in evidence in this accident especially with regards to the pilot. The basic elements were: Don't rush . . . get yourself oriented to the situation first . . . then make your move . . . unstrap . . . disconnect . . . get out."

Role of Personal Equipment

The role of personal survival equipment in the post-accident phase of this case merits considerable attention:

Shoulder harnesses and lap belts: The survivors had their shoulder harnesses and lap belts locked and tight. "Shoulder harness and lap belts were completely effective and doubtless prevented serious injury to all crewmembers," the AAR reports.

Helmets: All three crewmembers were wearing APH-5 helmets with nape straps and Hardman fittings. The helmets held firm protecting the wearers from head injury.

Life Vests: Post-accident inspection showed that the CO_2 cylinders had been actuated properly in the three vests. The vests failed to stay completely inflated because the CO_2 leaked out of the outer flotation cell of all three life vests where they had been torn or slashed in the crash, in the exit from the cockpit, or while the survivors were clinging to the wreckage. The middle flotation cells were intact and could be inflated orally; the inner flotation cells were intact and held the CO_2. All three life vests had been tested by the squadron parachute rigger two weeks before the accident.

Signal Mirror: The bombardier-navigator used the signal mirror to reflect light from the searchlight beams. Although this was not observed, the AAR states, the procedure is a reminder that the signal mirror can reflect light from sources other than the sun and can be of value even at night.

Signal Flares: The bombardier-navigator fired two night flares. When a searchlight that had been on him as he fired the second flare moved off, he threw the flare into the air to attract attention. His flares were visible from the carrier but not from the rescue boat because of the height of the waves. Since the bombardier-navigator was wearing a .38 caliber pistol, the AAR notes, it is considered that firing tracers would have been preferable to flares.

Whistles: The bombardier-navigator's and gunner-navigator's whistles aided materially in their rescue.

Flashlights: In both pick-ups the life vest flashlights, in the boat officer's words, "definitely aided in effecting the rescue." The third survivor's flashlight signals were seen by plane guard destroyer and whaleboat personnel simultaneously. Flashlight signals were also seen by personnel aboard the carrier.

.38 Caliber Revolvers: Two of the crewmembers were wearing .38 caliber revolvers but neither used them for signaling. The sound of tracer shots would have been very effective, the rescue boat officer states. Because of the height of the waves, tracers would have been more visible to rescue boat personnel than flares.

Orange Summer Flight Suits: Both the pilot and gunner-navigator had on orange summer flight suits. (The bombardier-navigator was wearing a tan summer flight suit.) Light reflected off the orange suits aided the pick up. The reporting flight surgeon strongly recommends that all CV pilots wear orange flight suits and helmets painted a similar color.

Parachutes: All three crewmembers unbuckled their parachutes and disconnected the bail-out oxygen and pararaft lanyard at an altitude below 1000' when entering the pattern around the carrier. "This is not squadron policy," an endorser of the AAR states. "Each crewmember must make this decision for himself. The merits of landing with the parachute buckled and the merits of landing with it unbuckled will continue to be stressed with the ultimate decision left to the crewmember."

Rescue Personnel Make Recommendations

Rescue personnel in this accident have a number of recommendations:

"From the standpoint of boat officer," the rescue boat officer reports, "it is my recommendation . . . that use of searchlights by ships involved be curtailed to a minimum (in a rescue situation). It is my feeling that the darker the survival area is, the greater is the likelihood of spotting a light, a flare or the like displayed by the survivors in the water. At several times when searching from the boat, the boat crew was almost blinded by searchlights from the ships. In addition, a better system of communication between rescue boat and controlling ship should be effected."

Among the plane guard destroyer skipper's recommendations are the following:

1) That the use of searchlights by the carrier be controlled so that no lights are directed on the rescue destroyer.

2) That the use of flares be kept to a minimum by all except the survivors. Spotting of survivors' flares or lights is most important. Many flares in the water tend to confuse boat personnel and each requires inspection.

3) That survivors, if at all possible, be picked up by the ship in lieu of a boat. This method is faster and much less hazardous when heavy seas are running.

4) That the color of the flight suit be either orange or bright yellow. ●

Applied

ONE hundred percent of the major accidents in which pilot factor is involved are caused by a mere 2.5% of our pilots!

Whaa? Whadde say? Well, he said that during fiscal year 1959 there were 896 major accidents of which 512 involved some degree of pilot factor. Since the number of pilots who have more than one accident in one year is negligible and since we have about 20,000 pilots and since 512 is about 2.5 of 20,000—see?

Just think of all the startling statements that can be based on those simple figures. For example, "A very large percentage of our aircraft accidents are induced by a very small percentage of our pilots." "Over half of our major accidents involve mistakes on the part of less than 3% of our pilots." "Just a few of our pilots are causing most of our accidents."

Hold it! This is getting out of hand. Pretty soon we will be conclusively demonstrating that reading causes warts. Who cares what four out of five New York doctors say when there are thousands of doctors in New York!

Statistics are gathered and selected for some specific purpose. They are analyzed and placed in a usable context by experts in order to give them meaning and importance.

Taken out of their intended environment, statistics can be used to distort and dramatize meaningless statements or to put a keen edge on some individual's axe.

There is a problem of double meanings in numbers just as there is in words. Call it, if you like, the semantics of numbers. What significance do you attach to the numbers 1732? The historian will observe that 1732 is the year in which George Washington was born. Right! The mathematician will remind us that 1.732 is the square root of 3. Also right! Then too, it is probably somebody's phone number.

The black horses eat more than the white horses because there are many more black horses than white ones. When you hear that most of our pilot factor accidents happen to pilots in the rank of ensign, jg, and lieutenant, be sure that the figures are modified by considering that our pilot popu-

Mathemagics

TRUTH IS STRONGER THAN FRACTIONS

lation is mostly ENS, JG and LT. Besides, the bulk of our carrier aviating is accomplished by 1, 1½ and 2 stripers.

Agreed that junior pilots may find themselves up against a problem they cannot solve due to lack of experience. Even properly adjusted statistics show that more experienced pilots are somewhat less likely to have accidents. It is just that the picture can be painted much blacker than it really is if all the factors are not included. Don't let anybody try to sell you the proposition that experience is the big cure-all.

Attention has been given also to the fact that there are some substandard naval aviators in the ranks. These pilots are variously referred to as "poor aviators" or "inferior pilot material" or "substandard flyers." Progress is being made in reducing the number of such pilots reaching the fleet by tightening the requirements for entrance into flight training, tightening the requirements for getting out of flight training (with wings) and by closely observing the operational performance of selected graduates.

The process of following and reporting upon newly designated pilots has revealed that the ones who had the most trouble passing checks and ground school classes are the ones who are most likely to have accidents after they join the fleet. It seems that there will always be some of these "poor pilots" who manage to survive the rigors of checks and tests and all the other challenges thrown at them by the training command. Also, there will always be some pilots who show up quite well in the training environment but just can't quite produce the goods when confronted with the operational situations.

The training command will continue to cut down the number of graduates who turn out to be unacceptable to the fleet. But, it remains for the fleet to detect and unload the few unsats who squeeze through. It is not enough to be tough and real regulation when check time rolls around. The key to the problem lies in being tough and real regulation all the time in tracing the progress or lack of progress of fleet pilots.

Don't let the cart get in front of the horse. All R4Ds are airplanes but not all airplanes are R4Ds. Any poor pilot can have an accident but not every pilot who has an accident is a poor one.

What is a poor pilot anyway? Is he one who had two downs in B stage? Is he one who just barely passed the navigation course? Is he one who gets a waveoff on one out of every five approaches? Is he one who made a hard carrier landing in 1956 and wiped out the nose gear?

Maybe. He may be all of these or none. He may be a combination of some of these types or of countless other types. So which is the pilot to get rid of? The term "poor pilot" and all of its brother terms such as "sub par pilot," remain undefined. The poorness of a pilot is largely a matter of feeling or impression. It cannot be computed. But if you talk to the pilots or crewmen in a squadron you will probably find out with some accuracy who the least proficient pilots are.

Here is the trap to avoid. This is a paraphrased statement taken from a recent safety council summary, "COs shouldn't allow a pilot who has had an accident or close call to continue flying because he is likely to do the same thing again." What this officer must have overlooked is that in the big majority of pilot summaries attached to AARs, the statement reads, "He is an excellent pilot with a very professional outlook on aviation. He has had no previous accidents." Accident proneness left the aviation safety vocabulary a long time ago.

It is a function of command to see to it that inferior pilots are dropped from flying billets before they have accidents. It is the job of the aviation safety program through command to find out why even good pilots have accidents. This program includes the collection of statistics—meaningful statistics from which are extracted indications of dangerous trends which can then be intelligently combatted.

If you are a speaker, stay away from sweeping, unsupported generalities. Such thunder may make good speeches but it is deceiving and is likely to do more harm than good.

If you are a listener, be a skeptic. Liberally lace with salt such show stoppers as, "Get rid of pilots who have accidents and you have solved the aviation safety problem." ●

Informal discussion between the pilot and some members of the aircraft accident board.

SPEAK UP:

Anything you say to the naval accident board is "privileged" and can't be used against you.

A LITTLE more than a year ago the United States Congress passed the new Federal Aviation Act of 1958 in an all-out effort to make flying as safe as possible.

The new law transferred the safety regulation making authority of the Civil Aeronautics Board to the new Federal Aviation Agency and gave it sole authority to regulate the use of the airspace and enforce safety regulations.

An important forward step was taken in that for the first time greater recognition was given to the requirements of military flight operations. The President was authorized to consolidate all military and civil research and development conducted by the respective military and civil agencies, insofar as they related to air navigation facilities and procedures. The administrator of the Federal Aviation Agency *has sole authority to allocate the use of airspace* to ensure its most efficient use by both civil and military traffic.

To complete this framework for the administration of aviation safety, the Congress specifically

A CAB aircraft accident investigation. The pilot is being cross-examined by a government attorney before a chief examiner while the stenographer is preparing a verbatim transcript for the public record.

provided for joint military and civil participation in aircraft accident investigations.

The Act vests in the Civil Aeronautics Board primary authority to conduct all civil aircraft accident investigations and to determine the cause of the accident. Section 702(a) of the Act provides that where an accident involves a collision between civil and military aircraft, the investigation will be conducted by the Civil Aeronautics Board. Close cooperation with military authorities in the investigation is established by providing for participation in the investigation by the military authorities. Of course, military investigators will prepare a separate report as in cases where only military aircraft are involved.

Section 702(b) of the Federal Aviation Act provides that where accidents involve solely military aircraft, the investigation shall be conducted by the appropriate military authorities. However, in the event some function of the Administrator is involved, such as the failure of an air navigation facility, the military authorities are required to provide for participation in the investigation by the Administrator of the Federal Aviation Agency. Section 702(c) of the Act requires the military authorities to provide the Administrator or the Civil Aeronautics Board with any information derived from their investigation of accidents involving solely military aircraft which, in the judgment of the military authorities, would contribute to the promotion of air safety.

Thus for the first time in the history of U.S. aviation the civil and military authorities are bound together by law to insure the greatest effort possible to achieve the highest degree of safety in the flight of aircraft. In order to work out joint problems under the law it provides for the assignment of military personnel to appropriate departments of the Headquarters Office of

the Federal Aviation Agency to assist the Administrator in carrying out his functions.

It is interesting to note at this point that the Federal Aviation Act, insofar as that Act relates to the regulation of civil aircraft manufacture, operations, and pilot certification, except for compliance with air traffic rules, *does not apply* to military aircraft, aircraft operations, and airmen.

A look-see at these differences in application of aviation laws and regulations reveals a different approach to the aircraft accident investigation by the military and of civil authorities.

In the first place, the need for safety regulation of civil operations differs sharply from the need of the military. While it is true that the highest degree of safety in both areas of operations must be the paramount concern of both civil and military authorities, the military operations are required for defense purposes and not for public air transportation. The nature of military operations requires separate regulation by that organization of the manufacture of its aircraft, training of its pilots and its aircraft operations. Keep in mind, however, that the Federal Aviation Act under Section 307 gives the Administrator of the Federal Aviation Agency sole authority to regulate the use of the airspace. Therefore, *air traffic rules promulgated by the Administrator of the Federal Aviation Agency must be complied with by military aircraft as well as civil aircraft.*

In contrast with military self-regulation of most of its aviation operations, the Federal Aviation Act requires the safety regulation of civil aircraft manufacture and operations and standards for certification of airmen. It also makes the violation of safety regulations by aircraft operators and airmen subject to revocation or suspension of certificates or to civil penalties assessed by the Administrator of the Federal Aviation Agency. The latter has the responsibility to see that disciplinary action is taken against violators.

No such general legal requirement to enforce military regulations confronts the military authorities, a situation which places military accident investigation in a unique position.

The Navy Department, in OpNav Instruction 3750.6D of 11 June 1959, paragraphs 69 and 70, and similarly the Air Force, by regulation, have stated a policy which declares a confidential relationship exists between the witness, e.g., a pilot, and the military investigation board which, in naval procedure, is preserved within the AAR—a privileged document so protected as a matter of policy.

The purpose of establishing this privilege is to permit full disclosure by the witness of all facts within his knowledge of the aircraft accident. Extending privilege to the report of the pilot to an AAR board to encourage full disclosure stems from the early Anglo-Saxon law where privilege was extended to statements such as made by husband to wife, patient to doctor or attorney to client.

Some States have enacted statutory provisions in motor vehicle codes extending privilege to statements made by automobile drivers, occupants and witnesses in motor vehicle accident reports. These codes provide that such statements are for the confidential use of state authorities for accident prevention and may not be used for evidence in any trial, either civil or criminal.

The privilege given the statements made by witnesses to the Aircraft Accident Board is similar to the attorney-client relationship where the client feels free to reveal all to his attorney in the interest of getting full disclosure of facts to defend his case. Therefore, since statements made by the pilot are privileged he has no fear of self-incrimination—he is assured his report or statements concerning the accident will not be used against him later for disciplinary purposes. However, individual military personnel are subject to further investigation by a separate legal board which may find justification for taking disciplinary action under the Uniform Code of Military Justice. *Privilege does not attach to statements made before this board.*

From a policy viewpoint the military authorities have determined that the benefit of obtaining full disclosure of facts relating to the cause of an aircraft accident *before the Naval Aircraft Accident Board,* far outweighs any need to *determine grounds for* disciplinary action. *Under the Federal Aviation Act the pilot has no similar protection.*

In this discussion reference is made only to the testimony of the pilot. It should be recognized that other crewmembers as well as maintenance or other ground personnel may be in some way at fault in connection with an aircraft accident. What is said about the immunity of the pilot applies equally to other civil and military personnel.

Now let's take a look at the actual procedures involved in the civil and military accident investigations.

In the investigation of a civil accident the CAB dispatches a team of experts to the scene of the accident. The investigators examine the wreckage and prepare engineering reports of fire or equipment failures, prepare maps and charts reconstructing the flight of the aircraft and take witness statements concerning the accident, including those from crewmembers if they survive. In some instances the crewmembers are unwilling or do not desire to make a statement until the formal public hearing is conducted by the Civil Aeronautics

Board. The public hearing is conducted along the lines of a court hearing. Witnesses to the accident are put on the witness stand and examined by the presiding CAB member conducting the hearing. Cross-examination of the witnesses is conducted by government attorneys where desirable to protect the government's interest. Among such interests is the necessity of determining violations of the safety regulations or obtaining information to defend a possible claim.

The pilot is required by law to testify and answer fully all questions asked which pertain to or are relevant to the accident. His statements at this time or those he may have previously given to the accident investigators are *not* privileged and his testimony becomes a part of the Civil Aeronautics Board's docket of the case which is a public document and available for perusal by anyone having an interest in the matter.

The only instance where a civil pilot could declare his testimony privileged is one in which he testifies that the information so revealed would tend to incriminate him and he therefore may invoke his right under the Fifth Amendment of the U.S. Constitution and refuse to testify. However, under the Act the Board can decide if his testimony actually would subject him to a criminal action. If the decision is negative the pilot can be ordered to testify and the Board can obtain Federal Court assistance if the pilot becomes recalcitrant. One thing must be understood, however, and that is the pilot cannot use the excuse that he might be subjected to disciplinary action under the Federal Aviation Act for his refusal to testify.

It should be noted that the military pilot is specifically excluded from the applicability of the civil penalty provisions of Section 901 of the Act. However, in the event a military pilot commits a violation of any applicable civil regulation the Act (Sec 1002a) requires the Board or the Administrator, as the case may be, to refer the violation complaint to the appropriate military authorities who shall, within 90 days, inform the Administrator or Board of the disposition of the complaint, including a report as to any corrective or disciplinary action taken.

This points up the real difference between the military and civil accident investigation procedures. The testimony of the military pilot or other military personnel involved in a military safety investigation is clothed with privilege by virtue of OpNav Instruction 3750.6D which provides that statements, embodied in the accident investigation documents, cannot be revealed to or used by *any* authority as a basis for disciplinary action. *Of course, the naval aviator or any other military personnel has no such privilege when testifying before a CAB accident investigation hearing, FAA safety investigation, or the military legal board of inquiry.*

Because of this privileged relationship, the naval Aircraft Accident Board is able to obtain the fullest disclosure of the circumstances surrounding the accident. The causes of many accidents which otherwise would be unsolved are being determined by the naval accident boards. The naval aviator thus, without fear of disciplinary action, is encouraged to give full cooperation in determining the cause of the accident.

As a result, appropriate engineering changes and improvements in training programs will continue to improve safety in future military aircraft operations. ●

Cdr. Sherman O. Morris, author of this article and a University of Wisconsin law graduate, is an attorney in the Office of the General Counsel, FAA. Following private law practice in Madison Cdr. Morris joined CAB and became Chief of the Civil Air Regulations Section. During his wartime career he served as Officer-in-Charge of the Naval Air Transport Service of several ground stations on the Eastern Seaboard and Pacific area. He wrote the first NAVPERS training book for naval transport airmen. On his return to civilian life he transferred to CAA (now FAA). In 1949 he took commercial flight training and continues to fly privately.

NOISE ABATEMENT

WHILE flying a local instrument hop in an F11F I was cleared for a Tacan penetration with a GCA pickup at NAS Miramar. My section leader had departed the 36-mile fix and left 20,000 feet. Procedure at this point is to be cleared to our final approach channel.

Two minutes after the leader, I reached the fix, started descent from 20M and told San Diego approach control I was switching to final control. There was the usual chatter on Guard and I was unable to read APC. Result, I turned Guard OFF.

I then received clearance to switch to final control frequency and rogered for it. By oversight I did not have this particular frequency preset on my ARC-27 so I proceeded to dial it in manually. The volume control is directly under the manual dial and while setting the frequency I unconsciously was turning down the

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Forms for writing Anymouse Reports and mailing envelopes are available in ready-rooms and line shacks. All reports are considered for appropriate action.

— REPORT AN INCIDENT, PREVENT AN ACCIDENT —

volume. Therefore, when I attempted to contact final control I was unable to hear any answer.

After calling several times I assumed they were not up on that frequency, so I returned to approach control. Due to the setting of the sensitivity dial, I was unable to hear any response to my calls.

At 13 M I was just about to enter the soup but with no radio contact I waved off and climbed back to initial penetration altitude. It was here, in checking around, that I noticed the sensitivity knob setting. All was loud and clear when I adjusted it properly.

As I have 300 hours in the *Tiger* the error should not be attributed to faulty cockpit familiarization. And though I have not heard of it happening before the proximity of the two controls makes it necessary to watch for this sort of communication failure.

Afterwards, in the readyroom, I discovered that approach control had tried to answer my calls by using Guard channel. You will recall I had it turned off due to interference, but now, with this small experience tucked away in my mental log book I'll monitor Guard, clutter or not.

DOUBLECHECK

ON TWO successive final-approach-to-landings, the S2F was very difficult to slow down properly. At 95 knots the aircraft appeared quite nose-high and each time full flaps were dropped, it shuddered slightly.

After the final landing we taxied in and folded the wings for the night. While doing this I noticed the de-icer boots pulsating. They had been activated in flight to check the system and I forgot to shut them off.

ALL CLEAR

ONE of our flight orders men needed three more hours in the air so, as our ship had just pulled into Argentia, we decided to do some helicopter flying on the airfield.

As I did not have tower frequency I telephoned for permission to fly around the field and use the duty runway for some autorotation practice. The chief in the tower said to fly by and if everything was okay he would wave to me.

I flew by and he waved. We flew around for an hour and everything went fine. After lunch we decided to go up and get the

remaining two hours in. This time I did not call the tower for permission.

Leaving the ship I flew by the tower and the observer waved at the tower for clearance as we had done that morning. Nobody waved back but everything looked clear so I went ahead and shot an autorotation to the runway and touched down. I wasn't there two minutes when I looked up and saw four big engines belonging to a WV-2 heading in tor a landing.

We must have seen each other about the same time because just as I picked up to move, his gear started retracting and he waved off.

I was monitoring Guard but heard nothing over it. Had I been able to listen on normal tower frequency I imagine my ears would have burned.

CLOUDED UP

I WAS number-four-man in a flight of Tacan-only equipped F11Fs taking off on a tactics hop. Following takeoff a controlled division climbout was made through the overcast.

Before commencing the tactics, I checked my Tacan with the home field and found it to be functioning properly. Then just to make sure it was operating normally, I switched channels to a station located about 20 miles north of home field. The set was okay and forthwith I transferred my attention to the tactics portion of the hop.

We had previously been briefed to make individual Tacan approaches at the end of the period so we split up as scheduled. I followed the needle to the Tacan holding fix for the home field and was cleared for an approach with a GCA pick-up. Almost immediately after commencing the approach I was in the clouds.

The first indication I had that something was amiss was when I broke clear of the overcast. I should have been over water, but to my amazement I was flying over hilly countryside. About the same time my GCA controller was getting rather concerned about not having made radar contact. When I glimpsed the hills I too was concerned.

Although I was still right on course according to my Tacan I already had an idea that I was where I shouldn't have been. A check of my Tacan channel selector proved it. I had been making an IFR-controlled approach to

the wrong field. It was easy but embarrassing to cancel IFR.

It is also easy to trace the mistake back to where I double-checked the equipment by dialing away from home field Tacan and then forgetting about it. Of course I had the ID tone tuned completely down and I neglected to visually check the channel selector before commencing the approach. It's not so easy to forget that my actions could have cost at least one airplane and pilot.

SEA STORY

I WAS the copilot in an HUS-1 helicopter taking some personnel out to the LPH for a conference. We were on board for approximately two hours and the ship was making turns to stay into the wind. When it came time for us to launch it was almost the scramble variety. The pilot and myself rushed to the aircraft, donned our Mk-1 poopy suits and jumped into the plane.

The pilot started the engine and as soon as the temps were up he engaged the rotors. We pulled a fast mag check and we were off. The ship was out of sight of land so control gave us a heading to the beach. We turned to 270 degrees on our Radio Magnetic Indicator and thought we had it made. After about five minutes the pilot, crew-chief, and myself all came to the realization that although we were supposedly flying west the sun was behind us. The ship had made a 180-degree turn so our RMI was 180 degrees out. So there we were about 50 miles off of the coast heading happily out to sea.

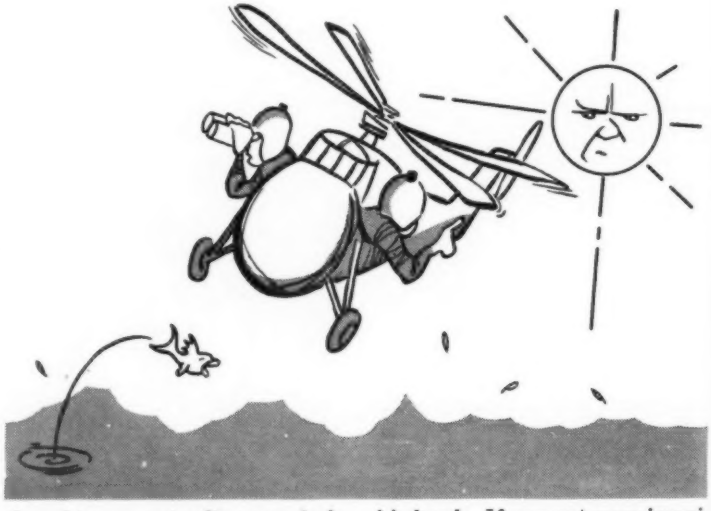
UNEASY

"ON A proficiency cross-country I was flying a T-28B and arrived at my destination without trouble. However I had never landed at this field before and upon breaking upwind, the tower called and asked me how long I would remain and at what area of the field would I like to park.

"After giving them the information I was given the choice of landing on runway three-six or three-two. Three-six would bring me close to the parking area I desired. This conversation had distracted me enough so that on final approach I felt uneasy about something; like that nagging thought you get after you lock up the house and start a vacation trip.

"I quickly checked the cockpit and at the same time pulled the throttle back to idle to check wheels. Sure enough. The horn blew—no wheels!

"It was simply a case of disrupted habit pattern. This is my first (I'm a LCDR type with 3000 hours single-engine time), and I hope my last, experience with a wheels-up pass."



FAST SHUFFLE

ONE cool morning I was cleared for takeoff from a Pacific Air Force Base and started my F9F rolling.

After about 2000 feet had gone by I noticed a jeep pull out directly in front of me and begin driving down the runway the same direction as my takeoff roll.

The closure rate was fantastic! The first time the jeep driver knew a mistake had been made somewhere was the whoosh of my *Cougar* about 20 feet over his head. If you put your imagination to work on the situation you can easily figure how that driver felt.

A hot runway or full fuel load would have resulted in an accident. The old standby precaution of looking both ways down a runway before crossing or entering is strictly enforced now days.

HIDDEN SWITCH

IT WAS a night like many others except that I had a night bounce hop in an F11F. My preflight of the plane revealed the lower fuselage light out but

rather than accept a delay to fix it, which would mean a late arrival for MLP, I went ahead and took off for the bounce field located some 20 miles from home.

Just prior to takeoff I ran the *Tiger* up to 100 percent and discovered the brakes would not keep the aircraft from creeping. I let it creep forward until I completed the checks then proceeded with a normal takeoff.

During my initial entry to the field pattern I used speed brakes but raised them prior to entering the break at 800 feet and about 250 knots. On my first MLP I was heavy and got a bit fast so I took a waveoff. The LSO commented on the lack of a fuselage light and I switched to the dim position hoping it might come ON.

My second approach was about average with an acceptable touchdown and no comments from the LSO. The third approach resulted in another touchdown and a call from the LSO to "check the speed brakes. Looks like something between your wheels."

Instead of checking the indicator I actuated the speed brake switch to the up position and was very surprised when the speed brakes came up! Since I had not used the brakes I thought they were only partially extended.

Due to a short interval between MLP periods I had made arrangements to refuel at this field and at the completion of the period I left my wheels down and made a final landing. On rollout I noticed the speed brake override switch cover was UP.

After getting refueled I made a preflight before climbing aboard for the second MLP period. At this time I discovered I had ground off about eight inches of speed brake. A part of the ruptured section was restingly snugly against the main fuel line! Fortunately the line was not damaged but the basic error was mine, the speed brake override witch must have been ON the entire hop.

This switch is hidden behind the power lever handle and my normal procedure is to check it and the afterburner nozzle open switch by feel—if the covers are down the switches are in the correct position. Thus in the initial break for landing I must have tapped the speed brake switch and the brakes stayed down through two landings.

I erred in raising the speed brakes when the LSO called and said to check them. The proximity of the main fuel line to the speed brakes is well known and the possibilities of a rupture due to the ground off brakes has been proven previously.

It all goes back to the beginning. An operating lower fuselage light would probably have prevented the incident. This light is very bright and the LSO and wheel watch would have seen the situation in time to have alerted me on the first pass. Moral: Do not try to improve availability by accepting an aircraft with minor discrepancies which might make the difference between an uneventful hop and an accident.

FEATHERING FIEND

DURING a production (o'haul) test flight in SNB-5 with full feathering props, the starboard engine was feathered to determine if the pressure limit cut out switch was set properly.

When I reached for the feather button to unfeather the engine, I unintentionally hit the port feather button. So both engines were now feathered (very quiet).

By securing all electronic equipment I was able to unfeather one engine, and with the generator operating, of course my problems were over.

On the surface this appears to be sheer stupidity—however, on closer analysis, I find that: when the right hand is used for feathering or unfeathering, both buttons are obscured from view by the hand, if the left hand is used this is not true.

The basic cause of this incident was, of course, overconfidence and carelessness. But—in 18 years I have (7300+ hours) checked out many pilots in twin-engine aircraft and have seen many of them reach for the wrong feather button. I thought this would never happen to me.

In my opinion, the feather buttons should be located on each side of the cockpit as in the R4D, R4Y, etc., or otherwise separated.

In order to prevent reoccurence of this incident we have designed a small divider between the buttons which will guide the finger to the proper button.

RAG DRAGGER

THE check crew had removed the carb air scoop on the AD-7 to fix a gripe on the carb air temperature bulb. Two red rags were placed over the carburetor to prevent foreign objects from being dropped into it. The check crew leader, because of the extra work load and lack of sleep, neglected to inform any of the crew about the red rags. The scoop was then repaired and replaced without the rags being noticed or removed by the check crew.

Bear in mind that all this took place at 0200 in a darkened ship condition and the check crew had been hard at it since 0500 the morning before.

When the plane was being prepared for launch the next morning, there was an extreme loss of power. Fortunately the pilot put his "thumb down" without any hesitation and in checking around the rags came to light. There was no engine trouble after that.

headmouse

Have a problem, or a question?
Send it to HEADMOUSE—he'll do his best to help.

Light Requirements

Dear Headmouse:

I would appreciate any information you have relative to the proper lights required on Navy aircraft. Specific questions that I desire answered are:

1. Whether or not anticollision lights are required or allowed on the ground.
2. If anticollision lights are on when airborne, whether navigation lights should be on steady or flash? Please list the references that you have used for your answers.

C. E. NILSON, LCDR
Safety Officer VW-2

► There are no regulations, Navy or FAA, concerning the operation of anticollision lights other than those which require that certain types of aircraft be equipped with them.

Reports have been received however, by both agencies, that it is difficult to determine the direction of travel of aircraft which are displaying both flashing aircraft position lights and anticollision lights. Discussion with FAA personnel revealed that this subject had been discussed by their personnel, air carriers, civil operators, and cognizant manufacturers but that rules for operation were not formulated due to the many differences in aircraft exterior lighting configurations.

It is the consensus however, that the best operating procedure, when operating aircraft equipped with anticollision lights, is to operate the aircraft position lights on STEADY when the anticollision light is shown.

In regard to ground operation of the anticollision light . . . no regulations exist at this time. Once again differences of opinion exist. The tower control personnel indicate that the showing of the anticollision light on the ground aids them in controlling ground traffic at night. Some pilots have reported that sighting the anticollision lights of aircraft operating on the ground has caused them to at least take a double-take on occasion.

Another problem which faces regulatory agencies in phrasing the rules for operation of these anticollision lights is "flicker vertigo." It is not recommended that the light be operated when actually flying in the clouds and the reflected light is visible in the cockpit. This problem is being passed on to CNO for possible resolution.

Very resp'y,
HEADMOUSE

What Price?

In regards to the recommendation by the squadron commander (that the Safety Center undertake a study to evaluate the worth of section takeoffs,) it is not within the scope of the mission of NASC to evaluate the operational requirements of fleet units. It is the function of the operational commander to determine the maneuvers required to accomplish the assigned mission.

The Safety Center believes in aviation safety, *but not safety at ANY* price. The mission dictates the type of flying that fleet units must perform to achieve a combat ready status.

HEADMOUSE

FUR Reporting

Dear Headmouse:

The following inquiries and recommendations concern the Failure, Unsatisfactory, Removal Report (FUR).

Much has been written about the Failure and Unsatisfactory part of this report, but little or nothing about the Removal part. GREB 86 L states, "A FUR/AMPFUR will *not* be submitted on engines that have operated satisfactorily for 90 percent of their authorized time." It would appear that removal information when linked with the Disassembly and Inspection Report (DIR) is highly desirable in ascertaining reliability. My question is should removal reports be submitted on equipments that have operated satisfactorily for their authorized time?

Another area of conflict in interpretation concerns item 7 of the FUR form. Relative to this item the following information is available.

a. NavAer 00.58B states that the number on the failed part will be inserted in this space, otherwise it will be left blank.

b. FUR Check-off Chart NavAer 00-25-457 dtd 1 October 1957 states that the number for item 7 on the FUR Form will be the number on the name plate or otherwise appearing on the failed part—*do not use number from IPB* (with an explanation as to why the number from the IPB should not be used).

c. Enclosure 3 to BuAer Reliability Digest 7-59 states, "Use part number from the failed part or IPB."

d. "Information Please" in the November APPROACH states, "Use number on failed part or IPB."

In trying to comply with the spirit and letter of the reliability program it is difficult to adhere to the obviously conflicting instructions. Accordingly it is suggested that the above matter be clarified and that the resulting information be incorporated in a subsequent issue of APPROACH magazine or the Reliability Digest.

H. E. SMALLING, CWO W-4

► Admittedly, the reporting of parts removals for causes other than failures or discrepancies has not been stressed. Forthcoming revision to FUR Instruction will stress the requirements for such reports, as they will provide essential information on service life.—In the case mentioned, where engine has operated satisfactorily for 90 percent of its normal service tour, compliance with GREB 86L (Not submitting FUR) does not result in the loss of valuable information, as this type of information is subsequently picked up from the DIR. *Reports should be submitted for all removals unless specifically exempted.*

Concerning Item 7 of FUR form: Reporting activities are urged to use any available reference books, including IPB to assist in correctly identifying part being reported. However, field activities should check closely to insure that part number in IPB is applicable to BuNo aircraft in question and that part noted in IPB is not a superseding part.

NavAer 00.58B and FUR check-off chart NavAer 00-25-547 dated 1 Oct 1957, will both be revised in the near future to reflect the use of reference books.

Very resp'y,
HEADMOUSE

'Survivor Sighted'

Dear Headmouse:

An incident a short time ago brought to light a problem of signaling between a survivor in the water and an aircraft . . .

A pilot bailed out over water and, upon entry into the water, inflated his vest. His wingman did not see him after ejection, but could see clearly the slick where the plane hit a short distance away. The wingman began circling the slick while searching for the pilot. After a short but, he believed, complete examination of the water in the area he reported that the pilot had apparently not evacuated the plane before it went in.

The man in the water could see that his wingman had him in sight (he thought, because it was circling almost directly over him). He saved his Mk 13 distress signal for the helicopter which he knew his wingman would alert.

This story has a happy ending, because the Coast Guard UF on arrival overhead sighted the downed pilot, solely by chance. It called the helicopter to the scene and our birdman lived to fly another day.

Frequently, a man in the water can be lost to sight, even if seen once in the water. The parachute helps mark the spot originally, but it sinks very soon and leaves nothing but the man. "However," you say, "he has a yellow mae west, and a yellow pararaft (we hope) that will help to locate him." Add to these multiple white caps and a three-foot sea and even if he has a red paulin showing you can lose him very easily.

We need a system to let the man in the water know we have him in sight. Until he *knows* he is sighted he should use all his available means to make himself visible. Our systems in the Corpus Christi area is for multi-engine planes to drop a smoke float, slightly up wind. Single-engine planes or jets drop the gear while circling and keep it down *as long as the man is in sight.*

We'd like to have a smoke float dropped by *all* aircraft; it's an excellent marker, and especially so if you lose sight of the survivor for a moment and need a starting point from which to orient your looking. But the jets and single-engine aircraft don't usually carry them, hence the wheels-down signal. We thought of making it wheels down for everyone, so there'd be only one signal—but what would the trusty P5M do?

Gear down on a jet will slow it down enough to keep the circle size fairly small to keep the man in sight. Rocking wings, changing direction of circling or any other such maneuver requires a turn away from the man, and could easily be enough to lose sight of him.

This is now the Corpus Christi area system to tell downed airmen when we have them in sight. Comments on the system would be appreciated and if we can hit upon a universal system the services will be unknown men ahead.

O. W. SILER, CDR USCG
CO, CG Air Det.
NAS Corpus

► It sounds like a fine idea, and we'd like to see some such universal signal adopted. The dirtied-up jet will burn away a lot of fuel while circling the survivor though, so perhaps it might help him to stay on station longer if he made one pass with gear down, to signal "I see you," and then cleaned up again. A partially open dye marker lasts a long time too, and, like the smoke float will help the airborne folks to localize their attention if they lose sight of the dunked one. However, we're told that some search aircraft will drop a smoke float to establish a surface reference point while in the process of searching for a survivor—this could lead a survivor to believe he's been sighted. Readers are encouraged to let us have their views on Cdr. Siler's scheme—we'll pass them to him and will publish a summary.

Very resp'y,
HEADMOUSE

TERMINAL TRANCE

WHEN the tape recorder was re-run, the pilot's voice came through the speaker unhurried and in a normal tone. However, nobody will know his feelings when GCA confirmed the latest destination weather: "Indefinite 100 obscured, with three-eighths of a mile in fog." He may have expected this report. The weatherman at his last stop had kept pointing to a damp sluggish front while saying that conditions wouldn't really improve until three or four hours after the flight was due at the destination.

Nevertheless the pilot had seized upon a sequence report carrying 200 broken, 800 overcast with 2½ miles in fog, signed his own clearance and took off. The distance was short, only 130 miles, but the pilot's outlook was adversely affected on this particular flight.

During the preceding hours

he had covered some 800 miles without incident. Close to his destination he found lowering weather and was advised of near minimum conditions there. Apparently considering it too poor for an approach he diverted and landed at an alternate. At this time he had made a decision to leave the airplane and complete the trip by bus or train—*to the point of carrying his luggage into Operations.*

Then after checking bus and train schedules, the resolution to leave his airplane began to crumble. At this hour of night surface transportation was infrequent. Finally the pilot made a long distance phone call and we know that after making the call he was under strong emotional pressure to resume the flight. There followed the previously mentioned session in the weather office where his earlier judgment about the poor weather was overcome. So he refiled and put his luggage back in the airplane.

Now he was in the soup, at night and alone in the AD. One consolation was the abundance of fuel in the tanks. Only 40 minutes had been used out of the six hours aboard listed on the DD-175. Also the departure field was still open; he could always go back there. He had in fact, said jokingly to the lineman that if he couldn't get in he would be back.

Approach control gave the AD a few radar vectors and handed off to the destination GCA. Early in the GCA transmissions the controller gave the field minimums, "Minimum ceiling 200 feet, visibility one-half mile," and followed it up with a repeat of current below minimum weather.

The approach was normal until 1½ miles out at which time the aircraft was 50 feet above glidepath. At one mile it was 200 feet above glide path and a waveoff was taken. Then the GCA controller asked the pilot if he desired another GCA or a clearance back to his departure point. "I'd like to try another," was the answer.

"Roger, approach control has cleared you for another approach if you desire. They have no other traffic."

The first part of this run went much like the earlier one. It was proceeding normally when at five miles, the controller came up with unsettling news. "For your information," he reported, "the weather has deteriorated. You have an indefinite zero with three-sixteenths of a mile."

The run continued down to one mile from the end of the runway when the pilot was informed he was approaching precision minimums. "Going 10 feet below the glide path," the controller observed; "20 feet below glide path . . . Now take a waveoff—sir, you are too far below the glide path . . . the centerline of the runway is too far to your left. Pull up . . . "

Split seconds later the GCA outside observer saw a flash toward the end of the runway. An observer at the end of the runway heard power being applied just before seeing the flash.

First contacts were with trees, then the AD struck a large concrete monument and was totally demolished by a violent explosion.

Following the accident there was a discussion by the chain of command concerning instructions and procedures which apply to IFR clearances and GCA. As might be guessed, the general tone centered around a desire to "tighten up." This paragraph from OpNav 3720.2A was not

During a second attempted GCA wheather deteriorated an indefinite zero with 3/16 of a mile visibility.

specifically mentioned but any tightening up would affect the present freedom of choice written into it:

"Except in an emergency, instrument approaches in reciprocating engine type aircraft shall not be commenced when the reported weather is below field minimums unless it has been determined that the aircraft has the capability to proceed to an alternate airport in the event a missed approach must be executed."

Though a choice is offered; shoot an approach or go to the alternate, it does *not* include the choice of descending below published minimums. On the other hand this choice *does* include the need for a large helping of realistic, mature cockpit judgment.

SOUP CUTTER SOP—During a night cross-country on the East Coast a flight of three HUS-1 helicopters flew into an overcast while cruising at 600 feet. The flight descended to about 200 feet in an attempt to get below the overcast and remain VFR.

While at this altitude the flight leader ordered a 180-degree left turn to return to the clear area but during the turn the flight lost visual contact with each other. The left wingman, to avoid a possible midair collision, nosed down to a lower altitude. At some point in this low altitude maneuver his automatic stabilizer equipment was accidently disengaged. All this, plus his concern for maintaining VFR brought the aircraft to such an altitude that it hit the top of a tree, damaging the lower nose section.

Intensive instrument training previously conducted by the squadron paid off as all three helicopters made successful GCAs at a nearby Air Force Base.

The flight leader did not brief his wingmen on the action to take if inadvertent IFR conditions were encountered and the board felt that had this been done the helo damage might not have occurred. Procedures for accomplishing this type of maneuver were recommended for inclusion in Squadron SOP and as part of cross-country briefings.

BIRD WATCH—While on a scheduled low-level navigation flight over a wooded, swamp area, and at an altitude of 200 feet, the A4D-2 aircraft struck a large black bird; probably a buzzard or a cormorant. Aircraft speed at the time of the bird strike was 340 knots.

The bird entered the port engine intake causing extensive structural damage to the duct lip assembly and duct internal structure, but did not enter the engine.

Large type birds, such as buzzards, which can do severe damage to a fast flying aircraft can be seen at a considerable distance, particularly when a member of a flock. Due to their relatively slow flight, they can be treated by the pilot as an almost stationary object.

It is felt that some bird strikes could be avoided by gentle evasive action, if taken immediately upon sighting a bird dead-ahead, or nearly so.

In this case the pilot continued on his flight after striking the bird. All pilots have been briefed to climb and attempt to ascertain engine or airplane damage after striking a bird and then to land as soon as possible, since it is often very difficult to determine at the time of the strike the damage to the airplane especially when the bird or parts of it enter the engine intake duct. ●

FLIP CHANGES

SINCE the Flight Information Publications came out several months ago, changes have taken place to improve this new system. All sections I of the Planning FLIP have been issued making it a world-wide document. Here are some of the new features of the Planning FLIP:

a. A new foreword which gives a brief description of enroute and terminal publications available for all areas, together with a list of abbreviations used in all of these publications. The NOTAM Code listing has been transferred to this section.

b. New divider cards are provided for the Planning FLIP with colors showing white for the U.S.; gray for Alaska, Canada, and North Atlantic; green for Europe; blue for the Caribbean; and yellow for the Pacific and Far East.

c. A quarterly checklist is issued for world-wide coverage. It gives dates of all available sections of the Planning FLIP, and when you may expect another revision.

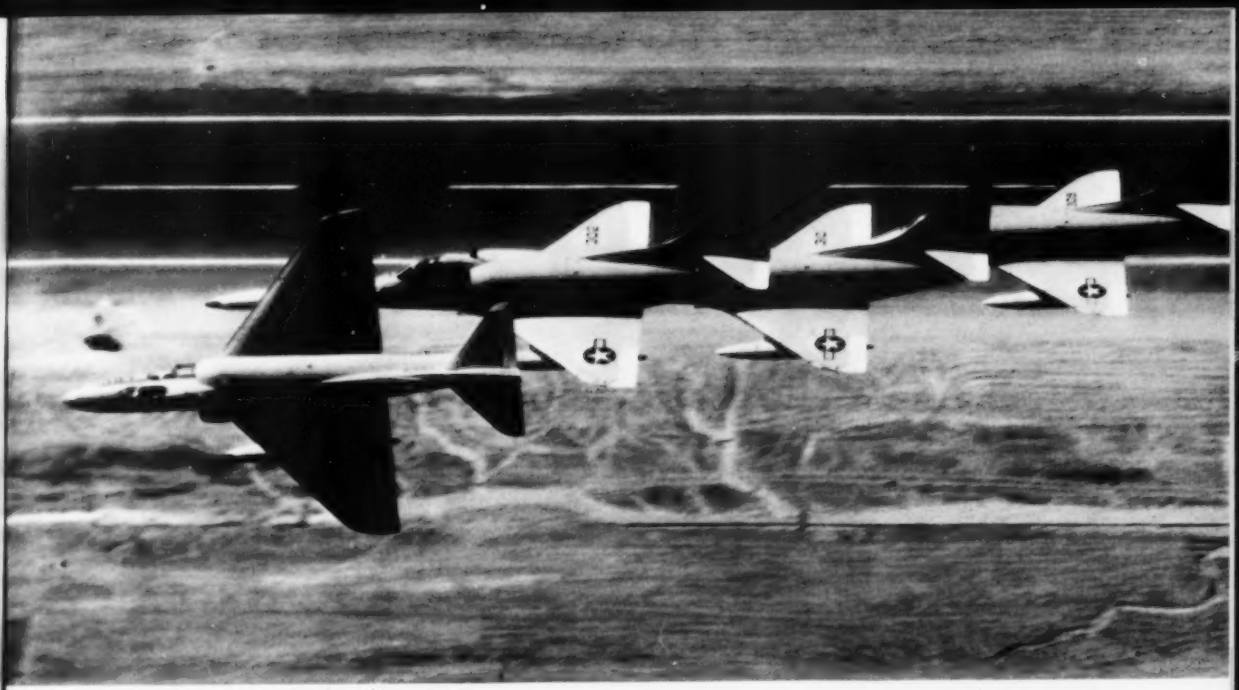
d. New features are being added to individual sections of the Planning FLIP. Some of these changes are:

(1) The new Index of Aeronautical Information in Section I of the United States.

(2) The list of preferred routes, terminus to terminus, in Section I to help with your flight plan.

(3) A new system has been added to indicate where changes have been made in the publication. Brackets alongside each new bit of information will alert you regarding changes.

A new product for use in planning is the FLIP Planning Chart Low Altitude, United States. This is a 6 x 9 feet wall chart with a scale of 1 : 1,824,000.



THE OVERHEAD BREAK

FAA comments on the 360° overhead approach . . .

THE advisability of the continued use of the 360-degree overhead approach method of controlling military turbojet fighter-type aircraft was investigated approximately three years ago. Our evaluation of regional office and field comments at that time overwhelmingly indicated that this type of flight pattern for military turbojet aircraft was favored over the conventional rectangular traffic pattern. During July, 1958, we conducted another survey on the same subject. Comments again conclusively indicated that the 360-degree overhead approach should be retained.

We would like to point out some of the major advantages of the 360-degree overhead approach:

1. Formations of jet aircraft can be more expeditiously handled into and through the traffic pattern onto the runway.

2. Only one radio contact for landing instructions and one for landing clearance per formation is necessary.

3. The tower controller has complete discretion with respect to approving or disapproving the approach.

4. The controller can retain more positive control over the size of the traffic pattern. This can be accomplished by requiring the jet aircraft to re-enter the initial approach or extend the point at which the aircraft makes a turn into the conventional traffic pattern.

5. As the altitude utilized in this procedure is usually higher until turn onto final approach, a degree of segregation is attained between 360-degree overhead approaches and conventional rectangular patterns.

6. Allows the controller to group his traffic by speed types to a greater extent than is possible with a conventional pattern.

7. Permits the controller to observe the aircraft during the entire approach after the initial approach over the airport. This is not always possible with a military jet aircraft in a conventional pattern.

8. Provides a safer approach to landing considering a possible flameout by the military jet aircraft.

Because of the above advantages, we believe the 360-degree overhead approach pattern is the safest and most expeditious method of controlling military turbojet aircraft at joint-use airports where a significant amount of this type traffic exists. Therefore, we do not plan to change our existing procedures at the present time.—(*Robert I. Gale—FAA*) *ALPA Tech Talk* ●

'By the

AT 0955 the pilot preflighted the A4D and climbed aboard for a carqual flight. The start was uneventful. All systems checked out perfectly. The call of "White flag, launch aircraft" sounded on the 5MC and the first two A4Ds went off in quick succession. The pilot, No. 2 for the starboard catapult, was quickly spotted for the launch. He received the turn-up signal from the catapult officer, went to 100% power, all normal, saluted. As he said later, "Everything was ready for the most harrowing two minutes of my naval career."

The initial jolt of acceleration was normal. Then the pilot, who had had three previous shots on this same catapult, felt there was a lack of acceleration and instantly realized something was wrong. He brought the power back to idle, began braking as hard as he could, and started arcing toward the port side to give himself a greater distance in which to stop. The aircraft slowed down considerably but, he recalled later, "it did not seem to want to turn left."

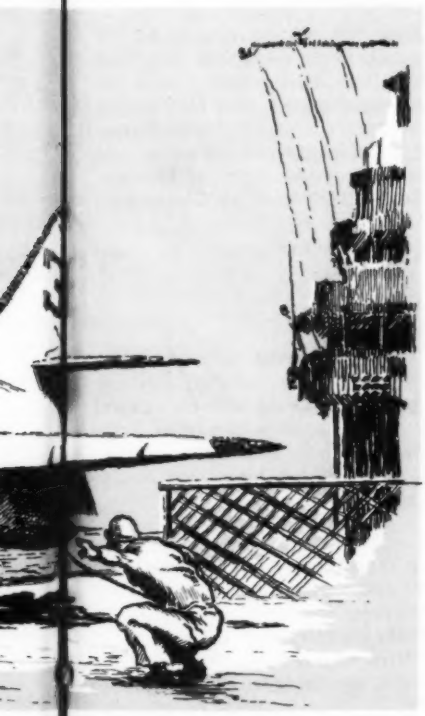
By this time the aircraft was near the center of the flight deck and slowly approaching the bow at a slight angle of 10 to 15 degrees. When it appeared inevitable that the plane was going over the bow, the pilot straightened the aircraft in order to hit in a clean nose-down position with as little side loads as possible.

Here is the pilot's own description of subsequent events:

"The impact with the water was much less than I expected. Not a drop of water came in. I took a deep breath and started for the ditching handle . . . There was a slight jolt. (Unknown to the pilot the ship had collided with the aircraft and split it aft of the cockpit. The cockpit with the pilot went down the port side of the carrier while the main portion went down the starboard side in an inverted position.) Then a tremendous turbulence and water started pouring in at very high pressure from all sides. It came in my nose and, in panic, I pulled my oxygen mask off. Through all this buffeting I kept thinking 'ditching handle.' I immediately surmised that the mechanism was damaged and decided to do everything manually.

"At about this time, the cockpit had bobbed out of the water in an upright position for two or three seconds and I caught a glimpse of the ship going by. (Shipboard personnel reported seeing the pilot in the cockpit working on his harness.) I reached over and opened the can-

Deep, Fifty!'



opy the normal way and it apparently worked. The aircraft sank again and there was an increase in the turbulence and buffeting.

"I succeeded in getting the two shoulder disconnects off and then went to work on the two leg straps. I kept trying to find them but this was made very difficult by the waist life preserver. I was just about out of breath when I decided to pull the ditching handle again. This time I felt my legs being released and with a few kicks I was free of the aircraft. Or so I thought! I looked about trying to figure out which way was up when I felt a slight pull. I was still attached to the airplane in some way! I traced it and realized that it was the oxygen hose which went from the seat to the console. I gave it a yank and it came free.

"I started to swim in the direction of the bubbles when it dawned on me that it would be much quicker to pull the toggles on my life preserver. This I did without difficulty and I kept swimming in the direction of the bubbles. I could see the surface and knew that I had the battle won even if I fainted from lack of air.

"I shot through the surface like a bullet. I lay there for a while breathing in fresh air and vomiting sea water which tasted like JP-5.

"The helicopter was right there waiting for me. On the first pass the pilot lost sight of me just as I was grabbing hold of the sling so he took it around for one more pass. In a way I was thankful as I needed more time to gather my wits. The second pass was successful. The helo had a little difficulty in pulling me up due to a no-wind condition and an almost full load of fuel. I was halfway out of the water and the helo had started to pick up forward speed when the sling came unsnapped on one side. (The snap on the hook of the helicopter rescue sling was so loose that it allowed one of the rings of the sling to come out.) I clamped my arms tight around my body to keep the sling from slipping and held the ends together. When I got up in the helicopter I realized that I had broken the little finger on my left hand while I was holding the loose end of the sling in place. (Otherwise the pilot was uninjured.)

"I estimate I was under water over a minute and a half and no less than 50 feet deep when I finally freed myself. The ship had completed about half of its turn and appeared to be about one mile away when I popped to the surface.

"I made two near-fatal mistakes," the pilot concludes. "(1) I should have tried the bailout bottle before removing my O_2 mask instead of panicking when I got a breath of salt water and JP-5 and (2) I should have tried the ditching handle more than once instead of immediately thinking it was damaged."

The AAR suggests that if a webbing with a standard parachute quick disconnect snap were attached to the helicopter rescue sling, a pilot wearing an integrated torso harness could snap it onto one of his shoulder fittings and be hoisted out of the water.

The accident report notes also that the location of the canopy-harness release in the A4D and the forces required to actuate it are such that it is questionable whether or not a pilot with an injured right arm could effect escape by this system. ●

MONITOR

Current Weather

It has been reported that aircraft approaching the station are receiving erroneous weather reports from the tower. Investigation revealed that this may occur when significant changes in the weather take place and the tower does not receive the latest observation from the Aerology Department. The Operations Officer was requested to take the necessary steps to assure that the tower immediately receives a weather sequence whenever any significant changes occur. It was also suggested that tower personnel advise Aerology of any observed changes and request an observation be taken.—*Aviation Accident Prevention Committee, N.Y.*

Knife Carrying

A discussion was held on the most suitable location for the survival knife. WgAvnSafO recommended that the knife NOT be carried on the left leg, as there would be a possibility of interference with the landing gear handle on several VF/VA models.—*El Toro*

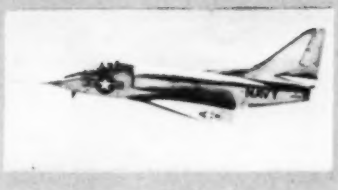
Tower Timing

The tower now has on its emergency landing check-off list to request from the pilot, the model aircraft, number of passengers and type of emergency. This will be passed to the hospital immediately. Additional information relative to fuel load, ordnance, etc., will be obtained only if time allows and the nature of the emergency will permit the pilot to distract from the actual control of the aircraft to pass this information. The pilot is not to be "badgered" by repeated requests for information.—*Alaskan Sea Frontier*

FOD Prevention

All personnel and particularly pilots must watch for objects on taxiways and runways which are potential causes of engine damage. These should be reported immediately to Maintenance Officers if noted by personnel on ground and to the tower if noted by pilots in aircraft. This is applicable to personnel of squadrons operating reciprocating aircraft as well as jet squadrons since both types use the same area and an AD-6 tail wheel bracket (actually found on the ramp) can ruin a jet engine as effectively as assorted nuts and bolts from ground handling equipment (NC-5s, ordnance fuse wires, etc.) and jet aircraft.

All personnel, shop, maintenance, line and pilots must be constantly alert for stray tools, hats, cigaret lighters and other objects that find their way into aircraft. The most serious consequences can result from a screwdriver forgotten in the wing fold of an aircraft.—*1st MAW*



EXCERPTS FROM SOME OF THE NAVY'S SAFETY COUNCILS THROUGHOUT THE WORLD, WHO PROVIDE LOCAL LEADERSHIP AND EMPHASIS TO THE NAVAL AVIATION SAFETY PROGRAM.

Need Light Standardization

There appears to be a general lack of standardization in the use of the anti-collision (Grimes) light on military aircraft. It was generally agreed that the accepted procedure is to have the anti-collision light ON at all times when airborne and that during periods of darkness the running lights to be on STEADY unless the anti-collision light is inoperative, in which event the running lights are to be on FLASH. Several members also noted that many municipal airports require that the anti-collision light be OFF during all ground operations. The consensus was that the adoption of uniform procedures is highly desirable in that confusion would be largely eliminated and risk of mid-air collisions further reduced.—*ComNavAirLant*

Safety Shoes

The flight surgeon of VP-48 commented on the increased number of foot injuries being incurred by personnel working around heavy equipment. A steel-toed safety shoe is carried in the Navy supply system, and the Chairman of the council requested that research be made into the possibility of procuring these shoes for personnel involved in work where the lifting and handling of heavy equipment is necessary.—*FAirWing Six*

Lip Service, Too

A recent strike damage (Charlie injury) accident might have been averted if the previous pilot had followed through on a verbal gripe with a "yellow sheet" entry. Pilots must be impressed regarding the importance of detailed yellow sheet entries on discrepancies. *After* a returned pilot has filled out a yellow sheet in detail and (if warranted) has discussed observed discrepancies with aircraft maintenance officer or operations officer, he has done *his* job, thoroughly.—*3rd MAW*

HSS CCA Approaches

HSS operation on the last cruise during adverse weather conditions demonstrated a high degree of proficiency both by pilots and controllers. Much was gained from the exercise and the need for corrective action in some areas was brought out in the following: 1. HSS pilots conducting CCA should be advised of surface obstructions (destroyers, etc.). 2. Helicopter traffic spacing should be based primarily on area rather than altitude separation. 3. Opportunity should be afforded for more HSS practice CCA periods. It is recommended that HS-7 develop and conduct tests using area rather than altitude separation. Such findings and procedures to be incorporated in a standard HSS CCA doctrine.

—*USS* VALLEY FORGE

rocket assist personnel ejection catapult

Fleet units have been asking questions about the RAPEC seat for some time. The $64 question is of course—"When will all aircraft in my squadron have the seat installed?" A firm schedule was not available at publication date though production model A4D-2Ns will have the new seat installed. Several means to expedite the installation are being considered, including the possibility of using modification teams.

TESTS have been completed on the long-awaited RAPEC (Rocket Assist Personnel Ejection Catapult) ejection seat. It is expected that kits will be available soon for gradual installation at the squadron level. BuWeps reports that it will expedite retrofit by supplying new seats to the squadrons rather than reworking the ejection seats presently in the aircraft. The Douglas-designed ejection seat powered by a rocket developed by the Bureau of Ordnance provides ground level escape from the aircraft as well as escape at all other altitudes and speeds within the range of the Skyhawk.

The A4D seat, besides incorporating the RAPEC I catapult, has additional new features:

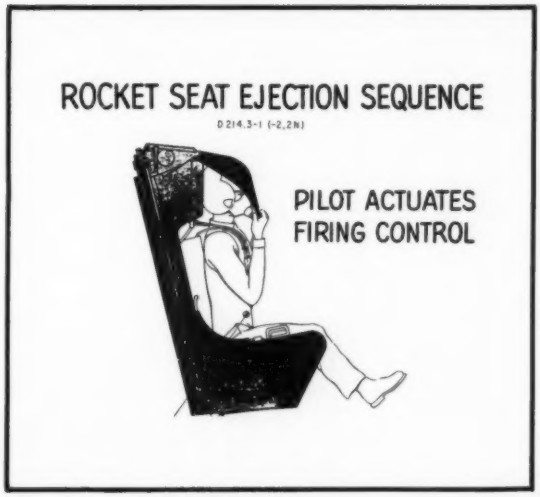
- An alternate ejection handle on the seat between the pilot's knees.
- Separation bladders to speed pilot-seat separation following ejection. The bladders, one under the seat pan and the other on the back of the seat, are inflated by nitrogen on seat separation.
- Automatic disconnect features for both the face curtain and the alternate ejection handle (sometimes referred to as a D-ring).
- A 28-foot flat parachute instead of the former 26-foot conical parachute. The larger parachute is less liable to be damaged at

high altitude and due to construction opens with less shock. The larger parachute also slows descent which is greatly to the pilot's advantage.

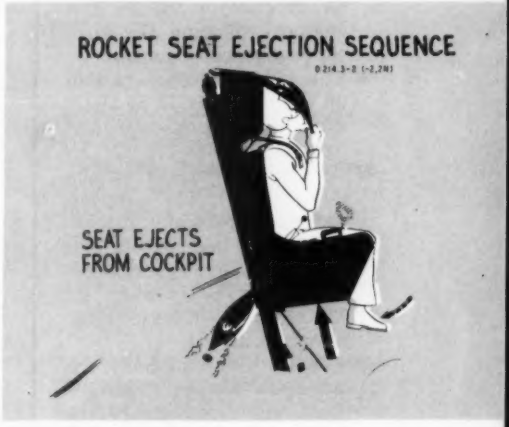
- Improved leg-retention consisting of extended sides on the ejection seat.
- An automatically tilting face curtain handle to position the face curtain for tall or short pilots.
- An improved harness release actuator which uses a Mk III Mod O ¾-second delay cartridge.
- A cartridge indicator mechanism on the seat-harness separator which shows whether or not a cartridge is installed.
- An energy-absorbing mechanism in the seat supports which reduces possible spinal injury during vertical crash loadings (wheels-up landings, ditchings . . .). The seat is attached to the catapult by rods which will elongate under high vertical loadings.
- An ejection controls safety handle in the center of the headrest which makes it quick and easy for the pilot to "safety" the seat on leaving the cockpit. Protrusion of this handle would prevent the pilot from flying with the seat safetied.

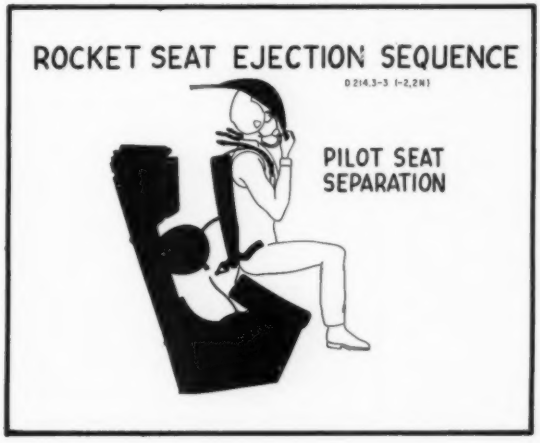
How does the RAPEC system work? Without getting deeply involved in engineering terms, here is a simplified explanation:

Actuation of either the face curtain or the secondary firing handle jettisons the canopy and then pulls the sear which fires the RAPEC catapult. Ignition of the propellant within the catapult generates the gas pressure inside the catapult tube which ejects the seat in a manner similar to the conventional seat catapult operation.



Diagrams courtesy of Douglas Aircraft Co.





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Prior to tube separation, a steel cable inside opens a slider valve allowing the flame to ignite rocket propellant within the tube. After tube separation, propulsion is by rocket thrust.

The RAPEC rocket puts a low G-load (10- to 12-G) on the pilot. In ground level ejection tests using dummies, the rocket has given trajectory heights up to 284 feet at a ground speed of 88 knots with parachute inflation as high as 200 feet.

Ejection Sequence

Suppose a pilot has to eject from his disabled *Skyhawk*. Here's the sequence of events:

- He pulls either the face curtain or the alternate ejection handle.
- The canopy jettisons. As it clears the ejection path, an interlock cam is disengaged allowing the ejection sequence to continue.
- The pilot continues to pull on the face curtain or alternate ejection handle and fires the catapult.
- As the seat moves up the guide rails: (1) Oxygen lines automatically disconnect from the console and the pilot's emergency oxygen supply is actuated. 2) The harness release actuator is initiated.
- After a ¾-second delay, the harness release actuator fires and accomplishes the following:
  - —Releases integrated harness and survival gear at all points.
  - —Disconnects both ejection control handles from seat.
  - —Punctures nitrogen storage bottle and the two separation bladders inflate.
- The pilot separates from the seat and the parachute automatic opener is initiated.
- After a 2-second delay the automatic parachute opener fires deploying the parachute (if below the pre-set altitude.)

Survival Equipment

The 28′ parachute (designated NB-9) for use in the A4D series aircraft upon installation of the RAPEC seat is a back style assembly designed for use with the integrated harness system. The parachute assembly is similar to the NB-7 assembly except that a special contoured pack is incorporated to provide improved comfort and compatibility with the A4D cockpit. The pack comprises a contoured fiberglas frame with integral comfort pad. Conventional type closing flaps are provided with semi-closed corners for improved wind blast integrity. Improved appearance is achieved by routing the pack opening bands through webbing tunnels inside the pack and the elimination of external snaps, buttons, etc., on the forward side of the pack.

Attention is called to the fact that APH-5 helmets must be modified in accordance with BACSEB 19-59 to eliminate the possibility of the helmet visor button catching on the face curtain handle of the RAPEC seat in the event of ejection. ●

CHIN STRAP CINCH

THE pilot of an F3H-2 experienced a partial power failure and was forced to ditch astern of the carrier during a recovery. Ditching conditions were ideal except for a bright sun shining into the pilot's eyes through a severe surface haze.

The ditching was apparently successful. The aircraft did not break up, but after coming to rest it sank within 10 seconds. The helicopter crew, over the aircraft almost before it stopped, were unable to sight the pilot as the plane sank. However, a helmet bobbed to the surface almost immediately and was retrieved intact with Hardman fittings, nape strap and chinstrap, and oxygen mask attached.

The nape strap had been loose and was torn at the eye grommet, stretching it another half-inch. The chin strap was loose, the buckle bent against the inner margin of the helmet by the force of a blow to the left Hardman fitting which forced the helmet side against the pilot's face. The Hardman bayonet fittings were both snugly in place and the oxygen mask was intact within it. The remainder of the helmet was essentially undamaged.

It was theorized that, although the blow to the side of the helmet may have stunned the pilot, the fact that his helmet came off so easily markedly jeopardized his chances for survival. The mechanism of release is believed to have been a forward binding of the head on the chest, lifting the mask and Hardman fittings off the face with subsequent roll-off of the helmet.

The chinstrap had been reinstalled inside the helmet after outfitting with the Hardman suspension had been done. However, the pilot had not cinched his chinstrap, probably because after the chinstrap was reinstalled the buckle was out of reach under the Hardman suspension.

Although the Hardman suspension is considered superior for highspeed, high-altitude bailout, the special situation of rapid deceleration involved in a ditching, where the head is sharply bent forward on the restrained torso, favors easy loss of the helmet whenever a chinstrap is not also worn, and *cinched up* on landing and takeoff.

—CVG-3 Flight Surgeon

HELO HOIST

AN F8U pilot ejected at 5000 feet after a flameout due to engine failure. After an uneventful parachute descent he landed in a densely wooded swamp. He wore his helmet visor down and his oxygen mask in place and covered his face with his arms for protection as he slipped through the tree branches and landed on his feet. He then released his rocket jet fittings on his integrated torso harness and freed himself. He left his parachute canopy hanging in the tree.

Unpacking his survival gear, the pilot spread his poncho out and readied his signal flares. Meanwhile, the intercept controller back at the air station had advised SAR of the F8U's last known position and the search had begun.

The survivor fired a day smoke signal at an R4D overhead but was unseen. About an hour later, his second daysmoke signal was spotted by a Marine helicopter on a routine training flight. However, the helicopter was unable to land because of the swampy wooded terrain. The helicopter pilot radioed for help and a HUS arrived a few minutes later but was also unable to land. Neither helicopter carried a rescue sling. A crewman aboard the HUS improvised a sling out of the safety strap across the cabin door.

The reporting flight surgeon, while noting that this improvised sling proved effective in this situation, points out the obvious dangers of the strap breaking or the survivor slipping.

"After a pilot survives an ejection," he states, "it would be tragic if he should be injured in the subsequent rescue. The presence of a tried and true rescue sling in each helicopter would do a lot to alleviate this situation." *(As the result of this accident, ComNavAirLant and AirFMF Lant have sent out messages requiring all helos with a hoist also be equipped with a suitable rescue attachment.—Ed.)*

It was also recommended that (1) a hoist sling attachment similar to the hoist strap on the Mk. II life vest be incorporated in the integrated torso harness or (2) perhaps a slight modification could be made to the hoisting line fitting so it can be attached to the same rings to which the rocket jet fittings are attached on the torso suit.

notes from your flight surgeon

Lanyard Mod

AFTER striking the ramp of the carrier and shearing the main landing gear and part of the tail pipe on his F8U-1, the pilot climbed to 1800 feet and ejected. He was rescued uninjured minutes later by helicopter.

Because of his speedy rescue, the pilot was not jeopardized by his lack of familiarity with his survival equipment. While strapping in before takeoff from the carrier, he had noted that there "was no D-ring for the pararaft lanyard on his life vest." He left the lanyard unfastened. The pilot was wearing a torso suit and the Mk-3C life preserver which has no D-ring for the lanyard. He should have fastened the lanyard to the right lap belt connector link on his torso harness suit before takeoff.

About the date this accident occurred, BACSEB 20-59 came out concerning the pararaft lanyard and the torso suit. BACSEB 20-59 authorizes a modification to the ripcord assembly and the pararaft lanyard of the pararaft kit in the highspeed container for use with integrated parachute assemblies. This modification eliminates the need for connecting the life raft to the torso suit before each overwater flight. With the modification incorporated, the pilot connects the raft lanyard to the right lap belt connector link of his torso suit as he descends in his parachute.

All pilots wearing the integrated torso suit should read BACSEB 20-59 and make sure that this modification has been made to their equipment by their parachute riggers.

Big Factor

FOLLOWING the crash of an S2F-1 over the side of the carrier, the aviation equipment officer examined the rescued pilot's life vest. One of the CO_2 cartridges had not fired. The firing mechanism checked out perfectly with a new CO_2 cartridge. Then the equipment officer put the original CO_2 cartridge back in the container, tightened the container cap halfway down and pulled the toggle. The vest failed to inflate. Tightening the cap one full turn at a time and pulling the toggle successively, he found that the bayonet failed to puncture the CO_2 cartridge until the cap was from 1½ to 2 turns from the full-seated position. Even then, inflation was only partial because of CO_2 leaking under the loose cap. Succeeding tests disclosed that as little as *one turn* from the fully-seated position of the cap resulted in only partial inflation of the vest. With the cap any more than two turns from the fully-seated position, puncture of the CO_2 cartridge did not take place at all.

The life vest of a second survivor of the same accident had inflated only partially on one side. The aviation equipment officer did an inflation test with the CO_2 cartridge container caps on tight; the vest held pressure for 24 hours. It was surmised the initial failure of the second vest to inflate on one side was also due to inadequate tightening of the CO_2 container cap, the reporting flight surgeon states.

Be absolutely sure that the CO_2 container caps on your life vest are screwed down tightly. *This is a big factor in proper inflation of your life vest.*

Fires Canopy

ON landing after a local flight, the pilot of an FJ was unable to open the canopy using the cockpit canopy switch. He taxied in and parked the aircraft with the canopy closed. After shutdown, he summoned a mechanic, in-

formed him of the difficulty and asked him to open the canopy from the outside.

The mechanic was unable to open the canopy using the external control switch so he stepped back and signaled the pilot by shaking his head and giving a thumbs-down signal. He then started up on the wing to use the manual operating handle.

When the pilot saw the mech's signal, he immediately pulled the canopy emergency release handle which fired the canopy. The canopy struck the dorsal fuselage and dorsal fin assembly causing dents, tears, and rib buckling. It bounced off and hit the concrete ramp 29 feet aft of the tailpipe and 15 feet to the left of the aircraft. The damage necessitated 65 man-hours of repair work.

"I just didn't think about the emergency release on the outside," the pilot stated later, "nor did I realize the force with which the canopy would leave the plane."

The canopy fires with the force of a 27 mm. shell. The pilot's hasty, unthinking act of firing the canopy could have resulted in severe injury to ground personnel in the vicinity of the aircraft as well as extensive property damage.

According to the report, the pilot is undergoing five hours of instruction and observation in the cockpit procedures trainer prior to his next flight. In addition, he will be required to conduct briefings for attached VF squadrons on proper methods of FJ canopy operation.

Dangerous Situation

SURVIVORS being rescued by helicopter should be given time to correctly position themselves in the sling, the flight surgeon reporting a HSS-1 ditching states.

"One crewman was hoisted out of the water while attempting to enter the rescue sling," he notes. "This obviously dangerous situation should be made clear to all flying personnel. A survivor should not cling to the sling if it is hoisted before he has entered it to the best of his ability. Also all hoist operators should be aware that a survivor should not be hoisted until the man is obviously in the sling properly or signals with a 'thumbs-up' that he is ready for hoisting."

Don't Pack the Pockets

THE Z-3 cutaway anti-G suit is intended to be worn over the summer flight suit (refer BAC-SEB 23-57). However, as recently pointed out by an endorser of an AAR, carrying articles in flight suit pockets covered by the anti-G suit reduces the effectiveness of the anti-G suit bladders. It also makes the edges of the cutaway anti-G suit bulge out, creating a snag hazard.

When you wear a cutaway anti-G suit over a summer flight suit, don't pack the flight suit pockets!

'Say again all after, "altimeter setting." '

Best by Test

"IN MY opinion the rescue anchor (helicopter rescue seat) is as simple and foolproof a device as I have ever encountered. I found after climbing on it that the ride up was one of security and comfort since the survivor is sitting instead of hanging as with the floating ring type of rescue device (the helicopter sling). I strongly endorse the use of the rescue-anchor throughout the fleet."—*Pilot after overwater ejection*

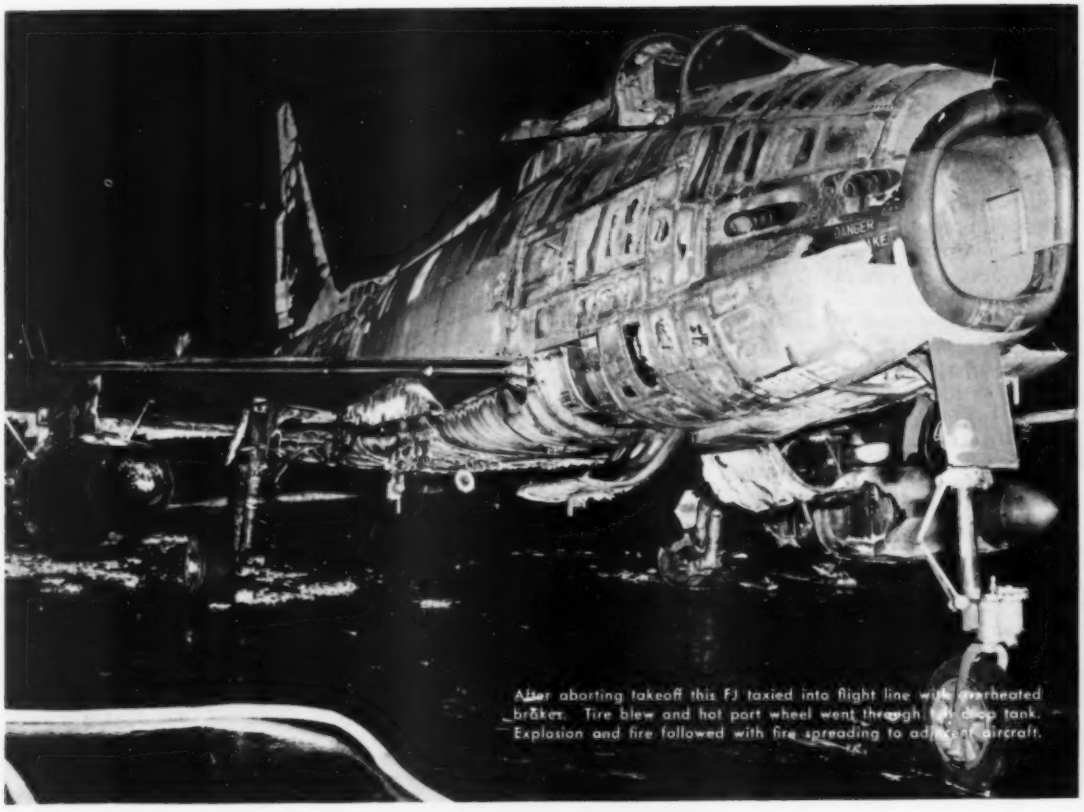
Unsuited for Flight

AFTER trying unsuccessfully to get the gear of the A4D fully extended and locked, the pilot made a wheels-up landing.

The Aircraft Accident Investigation Board stated that an attempt to induce greater G-loads on the nose gear at a higher altitude might have locked the nose gear in a down position. In the Board's opinion, the pilot should have attempted this before trying a touch-and-go bounce, "which is recommended only as a last resort."

However, contrary to squadron doctrine, the pilot was not wearing an anti-G suit as "this was only an FCLP hop!"

"What started out as a routine low altitude landing practice hop in this case," the reporting flight surgeon says, "could have involved strenuous high G-load maneuvers in order to overcome the unsafe nose gear condition. Without anti-G suit protection, however, any maneuver of this type would have been potentially very hazardous." ●



After aborting takeoff this FJ taxied into flight line with overheated brakes. Tire blew and hot port wheel went through [illegible] tank. Explosion and fire followed with fire spreading to adjacent aircraft.

SAFE HANDLING OF HOT BRAKES

Exploded wheel half continued on its flight path for 283 feet after dumping 200 gallons of JP-4 on the ramp.

BuAer Instruction 13420.1 emphasizes the danger of possible explosive failures of overheated wheels and tires. It recommends aircraft operating precautions which will avoid excessive brake use and outlines procedures for cooling overheated brakes, wheels and tires. BuAer speedletter Aer-AE-6321/34 of 13 April 1959, same subject, is superseded and canceled by this instruction.

Explosive failures of high performance aircraft wheels and tires are increasing in number and occur when excessive brake heat is transmitted to the wheels and tires. However, such failures may be expected only during land-based operations.

● Excessive brake heat results from abnormal conditions such as aborted takeoffs, dragging brakes, multiple braked stops in a short time or fleet operating requirements which dictate increased gross weights and/or landing speeds. Weight and landing speed increases impose energy absorption requirements in excess of those for which the brakes are designed.

● Excess heat increases tire inflation pressure and decreases the strength of wheels and tires resulting in possible explosive failures. A bursting tire may also blow away parts of a door or fairing.

● Dangers are appreciably increased when a fire occurs in the wheel and brake assembly since the extreme heat from ignition of one or a combination of the following: organic brake lining, hydraulic fluid, fuel, rubber tire, bearing lubricants, or, in cases of extreme temperatures, magnesium.

● Explosive failures have been reported occurring when cooling type extinguishing agents were used on landing gear fires, or, were used to cool overheated wheels and brakes. Sudden chilling of an overheated wheel results in detrimental thermal stresses which may affect the strength of the wheel. On the other hand, a number of explosive failures have been reported where no cooling or extinguishing agents were used, pointing out that failures are not always induced by applications of cooling type extinguishing agents but improper applications of such agents can accelerate failures.

The following precautions and procedures should be observed to insure personal safety.

Pilot Precautions

● All pilots and other personnel authorized to taxi the aircraft should familiarize themselves with braking instructions for the particular aircraft.

● Take maximum advantage of aerodynamic braking.

● Take full advantage of runway length during landing roll to avoid braking at high speeds or last minute severe braking.

● Taxi at a speed that will minimize the use of brakes; make maximum use of aerodynamic or nose wheel steering.

● Allow sufficient cooling time between flights or after an aborted takeoff (45 to 60 minutes). If operational necessity dictates immediate takeoff gear should be left extended as long as practicable to permit maximum cooling.

● Upon any indication of brake malfunction, the aircraft should be maneuvered off the duty runway, stopped, and be towed in. The aircraft should not be taxied under any circumstances after excessive brake use nor towed into a crowded parking area until the brakes have been properly cooled.

● Parking brakes should not be set while the brakes and wheels are in the heated condition.

● When an aircraft is subjected to excessive braking (especially on aborted takeoff stop) the

Crash fire fighter applies water fog to hot brakes on F3H using insecticide sprayer.

fire department should be alerted and other personnel advised to stand clear.

Ground Personnel Precautions

► The fire department should respond immediately when alerted that an aircraft has been subjected to excessive braking.

► When an overheated wheel and brake assembly or wheel-brake fire occurs, all personnel not required for fighting the fire or cooling the assembly should evacuate the immediate area.

► Required personnel should approach overheated wheels with extreme caution in a fore or aft direction—*never in line with the axle!*

► If the tire is flat explosive failure of wheel or tire will not result. However, upon sudden cooling, an overheated wheel may fracture or fly apart, which could hurl bolts or fragments through the air with sufficient speed to injure personnel.

► Heat transfer to the wheel will continue for some period of time until the brake is cooled. Therefore, the danger of explosive failure may exist after the aircraft is secured if action is not taken to cool the overheated brake.

Cooling Procedures

The primary means recommended for cooling overheated wheel, brake and tire assemblies is to park the aircraft is an isolated location and allow the assembly to cool in ambient air for a period of 45 to 60 minutes.

Cooling agents to accelerate cooling are cautioned against since application of agents exposes personnel to danger by requiring proximity to the overheated assembly. However, if it is necessary to accelerate cooling either of the following methods is recommended:

(a) If application equipment and wheel and brake design permit, concentrate the cooling agent primarily at the brake, and not to the wheel, making direct contact with the exposed portion of the brake. Use water for cooling by directing a straight stream to the brake. Apply in 10 to 15 second periodic bursts, not a continuous discharge. Each application should be separated by a period of at least 30 to 60 seconds. A minimum of three to five applications is necessary. Once the brake has been properly cooled, permit the wheel to cool sufficiently in ambient air. A crosswind or forced air from a blower or fan will assist in cooling the wheel. *(Use of propeller blast is reported to be effective also.—Ed.).*

(b) Use water fog for cooling by deflecting fog to the brake side of the wheel; apply in 5- to 10-second periodic bursts, not a continuous discharge. Each application should be separated by a period of at least 20 seconds. Use as many applications as necessary.

If water is not available, use any other liquid agent available. Use of CO_2 for cooling is not recommended.

Do not move the aircraft for at least 15 minutes following cooling applications.

Fire Fighting

Don't mistake hot brakes for brake fires. Several incidents have occurred in which mechanics were endangered neeedlessly.

◆ The first fighting procedures specified in U.S. Navy Aircraft Fire Fighting and Rescue Manual NavAer OO-80R-14 should be followed, however, it should be remembered that with a landing gear fire, the possibility of an exploding wheel or tire is increased and extreme caution should be used.

◆ Once the fire is extinguished do not discharge additional agent for the purpose of cooling the wheel assembly. Proceed as recommended in the cooling instructions.—*from BuAer Inst. 13420.1* ●

TROUBLE SHOOTING THE J65-TJL2 FUEL CONTROL

Findings, conclusions, and recommendations from selected engine Disassembly and Inspection Reports.

Findings: The fuel control was removed and returned to overhaul due to engine overspeed and overtemperature. Bench test in the as-received condition revealed the fuel control was above rich limits at all test points above 80 percent rpm on the sea level acceleration schedule. Rich limits were exceeded by approximately 50 percent. The peak fuel flow was 11,000 lbs. per hour. The altitude curve was approximately 35 percent above the rich limits.

The temperature hysteresis test, during which the thermostat is cycled from plus 80°F to minus 65°F and back to plus 80°F was unsatisfactory. Repeatability requirements on this test are 485 lbs. per hour; however, this control repeated within 3100 pounds per hour. The maximum throttle angle was 83.5 degrees. The test was rerun with a master thermostat set to 80°F standard flow and tested satisfactorily except for the governor hysteresis test. Test limits are 395 lbs. per hour. This control tested 600 lbs. per hour.

Disassembly inspection revealed a defective thermostat. The first convolution of the bellows was elongated on one side causing the entire bellows assembly to cant at an angle. A corresponding score mark was found on the temperature control sleeve Part No. 193869 in which the bellows operates. The free height of the bellows was .022 inch shorter than the inscribed height on the part at manufacture. The allowable deviation is .007 inch.

Conclusions: (1) The reported engine overspeed and overtemperature was caused by the combined results of overrichness and excessive governor hysteresis.

(2) The overrichness was caused by the defective thermostat assembly.

(3) No direct cause for governor hysteresis could be found.

Recommendations: When an overrich condition is suspected the following trouble-shooting procedures are recommended:

1. With the engine static, note the maximum throttle angle on the fuel control throttle quadrant. If it is less than 86 degrees the control should be suspected. Proceed to step 2.

2. During ground runup note the peak fuel flow reading obtained. For ambient conditions of 30" HG absolute and 80°F fuel flow above 9000 lbs. per hour is excessive.

3. If both conditions are found positive, the fuel control should definitely be replaced. If one condition is found, a Jet-Cal check is recommended. If the condition is not alleviated by the Jet-Cal check a precautionary fuel control replacement is recommended.

Note: Total throttle travel on the fuel control quadrant at 100 percent rpm must be from 86 to 90 degrees. Total travel in excess of 90 degrees is indicative of a lean drifting fuel control, i.e. fuel flow on the lean side of the fuel flow curves. This condition will result in loss of power. Fuel controls in which total travel exceeds 90 degrees will be rejected. (Reference: AN-02B-35AAc-2, Sect. III, Table VII, Item 19, page 78)

R3350-34 *Findings:* The No. 18 piston Part No. 136376 had the upper ring land broken and burned away adjacent to the exhaust valve relief pocket. The No. 1 ring groove of this piston was severely worn and distorted. A hole was burned through the exhaust valve side of the piston in the ring belt and the No. 1, No. 2, No. 3, and No. 4 piston rings were burned and broken.

Conclusions: Failure of the piston was due to excessive wear and failure of the upper ring land. Excessive high cylinder temperatures and pressures together with marginal fit of the No. 1 compression ring will cause piston ring land wear and failure. The fit of the piston rings to the ring grooves has been revised to aid in the prevention of this type of piston ring land failure. All pistons currently being installed in this model engine are of a redesigned configuration which is known to be more durable. New pistons are now being marked to determine the number of hours they have been in service in order to determine if a maximum service life limit should be set on all pistons or only on those installed in certain locations on the engine.

Recommendations: Close adherence to the recommended cylinder operating temperature and pressure limits is necessary to aid in the prevention of cylinder and cylinder component part failure.

Tow bar in poor repair caused F8U to overrun its tow tractor—Collapse of the aircraft's nose gear and damage required 1000 manhours to repair.

TOW BAR TROUBLES

Ground accident reports indicate the universal tow bar is the source of considerable trouble and that many units are oblivious to the fact.

The universal tow bar became detached from the nose wheel of the FJ during towing operation. The airplane overran the towing tractor which had stopped after the tow bar became detached. The impact of the airplane against the tractor collapsed the nose gear and the airplane came to a stop with its nose resting on the rear of the tractor. Holes in the tow bar which hold the cross spreader were elongated from 7/16" to 7/8". Play in the tow bar is such that the studs can very easily vibrate out of the nose gear of a towed airplane. The drilled holes in the cross bar assembly for retainer pin insertion are unmarked as to applicable type airplane. This situation lends itself to improper tow bar attachment and combined with the existing play presents a continuous accident potential.

IN nearly every report plane handlers state that "minor" difficulties had been experienced with the universal tow bar prior to the accident. Yet a review of FUR reports does not indicate that this piece of equipment is other than satisfactory. Accident reports serve a purpose in accident prevention but they are submitted after the fact and not before; meaning, we are learning things the hard way. To acquaint those units which have yet to have their tow-bar accident APPROACH presents the following case history.

An F8U-1 was being towed by a tow bar (Universal front and rear towing, NAF 601364, stock No. R1730-243-2446-S030) and a Hugh aircraft towing tractor for return to the line. After about 100 feet of travel and while at about 5 mph, the tractor driver removed his feet from the accelerator and while decelerating, started a slight right turn. At this time the tow bar detached from the nose gear.

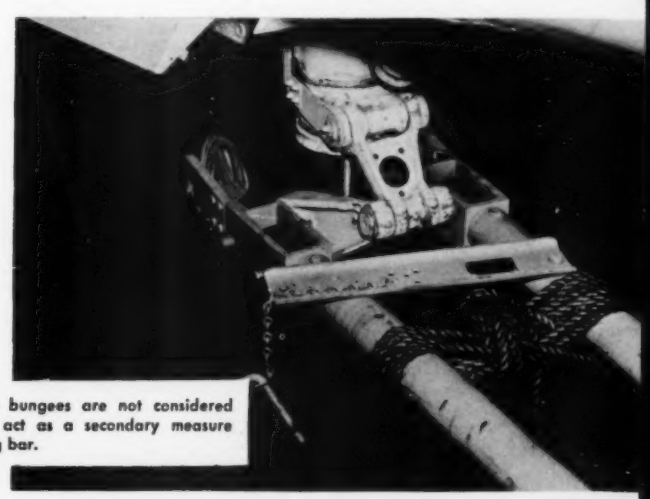
In falling from the nose gear, the spreader bar with its locking pin still inserted through it, came loose from the starboard tow bar arm. As the tractor decelerated, the nose gear overran and skidded momentarily on the spreader bar and pin. It then passed over the spreader bar and ran up the inside of the port arm of the tow bar, overrunning the tractor and striking it in the following sequence: the intake duct passed the driver's left shoulder striking the left side of the drivers seat and then hitting the rear edge of the tractor hood and tearing it off.

At this point the driver applied brakes, stopping the tractor. The knee formed by the scissors connecting the nose gear to the strut struck the rear of the tractor. This tore the nose gear "V" link, CV15-464025-5, from the structure, collapsing the nose gear and allowing the aircraft intake duct to drop onto the tractor's left fender. The aircraft then settled and came to rest on the ground and the tow bar. Damage was estimated at 1020 man-hours to repair.

This accident was caused by the tow bar falling from the aircraft, the tractor driver applying brakes after separation, and the brake rider not realizing this in time to prevent the collision with the tractor. It was proven by tests with this tow bar that with the spreader bar and its locking pin properly in place, there was excessive play between the lugs which insert into the nose gear thus allowing the bar to fall from the aircraft. This movement was caused by wear at the point of attachment of the tow bar wheel assembly and the tow bar arm and also elongation of the bolt holes and wear of the bushing through which the spreader bar locking pin is inserted. It was also proven that the brake rider is unable to see the towing tractor over the nose of the aircraft while using the standard tow bar. The tractor can be seen by leaning out over the canopy rail, but, for the average sized man, this requires him to remove his feet from the brakes. In spite of these facts, had the brake rider been more alert, or had the tractor driver elected to accelerate away from the detached aircraft, the accident could have been prevented. The third factor contributing to this accident was the nonavailability of new tow bars.

The shortage of tow bars has been a contributing factor. Operating units should endeavor to repair all of the universal tow bars now on hand.

To prevent a recurrence of this type accident, the reporting command has initiated the following precautions:



Webbing straps, lines, or bungees are not considered a proper fix to replace or act as a secondary measure for the function of the spacing bar.

1. The importance of being alert to prevent aircraft damage and personnel injury at all times has been strongly re-emphasized to all tractor drivers and brake riders. Brake riders have also been instructed to ride brakes with the seat full up when possible, and brake pedals full aft.

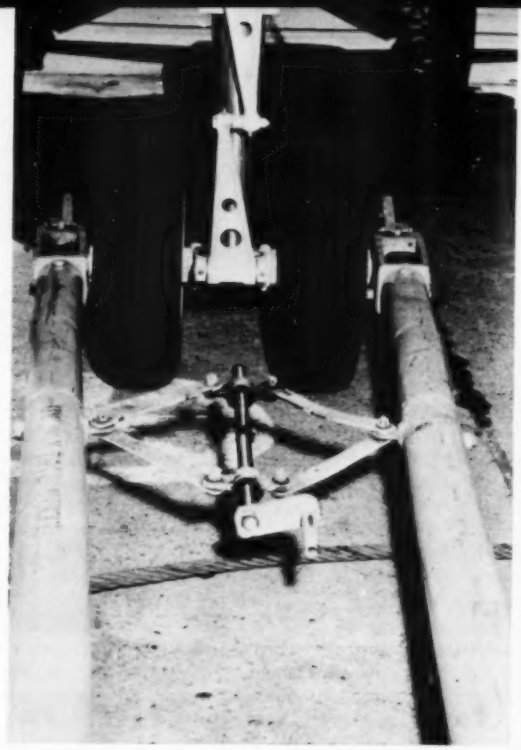
2. All tractor drivers have been designated tow bar inspectors and as such are personally responsible for the close inspection of the tow bars and their attachment to the aircraft.

3. Two methods of attaching the tow bar to the aircraft are being evaluated:

a. The spreader bar is being anchored to the starboard tow bar arm by a bolt and wing nut instead of a pin.

b. On other tow bars, a bungee is being tied to the center section of the spreader bar through two of the spare locking pin holes. The bungee loop is then passed under the starboard tow bar arm and up over the end of spreader bar and its locking pin, thus anchoring it securely.

Webbing straps or bungees are not considered a proper fix to replace or act as a secondary measure for the function of the spacing bar. Redesign of the spacing bar should have been recommended long before this accident took place.—Ed.



O&R Norfolk modification includes 18" and 30" length extensions and screw jack scissors to secure tow fittings to nosewheel.

4. All tow bars are being taken out of service immediately upon sign of wear of the type described above.

It was stated that the design of this tow bar renders it unsatisfactory for use with the F8U. The following recommendations are made in the interest of improving this design:

a. That the aft (wheel and attaching lug) section of the tow bar be more securely fastened to the tow bar arm by lengthening the over-lap of the pipes and using four bolts (two verticle and two horizontal) in place of one to secure them.

b. That one of the two methods described in item 3 above be used to secure the spreader bar and pin to the tow bar arm.

c. That the attaching lugs which insert into the nose gear sockets be made longer and nearer to the diameter of the socket.

d. That spare spreader arms and tow bars be made available to replace those that begin to show wear.

e. That the tow bar should be lengthened a minimum of two feet to provide for better visibility by the brake rider and more clearance between the tractor and the intake duct.

Note: (1) Tractors converted to carry a GTC unit require extended tow bars; (2) Experiments with four-foot extensions resulted in tow bar bending during sharp turns.—Ed. ●

Towing

The following paragraphs are taken from the United States Navy Safety Precautions, OpNav 34P1 in regard to the towing of aircraft:

Authorization. Personnel shall not move any aircraft with towing equipment without first being duly authorized.

Operation of Equipment. Only qualified personnel shall move or operate towing equipment and attachments. It shall be made certain that all is clear and in readiness prior to operation of equipment.

Towing Attachment. Towing couplings shall be thoroughly inspected prior to towing. Only approved attachment devices will be used. Attachments shall be made secure to couplings on the airplanes provided for this purpose.

Towing. Towing will not begin until an authorized and qualified operator is in the cockpit and ready to operate the aircraft brakes when necessary.

Towing Speed. Towing speed should never exceed five miles per hour. Sudden starts or stops shall be avoided. Extreme caution shall be exercised when towing an airplane over rough or muddy ground, or into or through a congested area.

Wing Walker. When towing an airplane near hangars or obstructions, a wing walker should be stationed at each wingtip to insure adequate clearance. At night the wing walker shall carry a flashlight or luminescent wand.

FIT TO BE TIED

THIS F4D-1 was spotted athwartships on the angle deck forward of the port mirror for a launch. Three chain tie-downs were used. The main landing gear had one tie-down each deployed outboard to prevent the aircraft from rolling forward and the nose gear had one tie-down deployed inboard to prevent the aircraft from rolling aft. A flight deck plane handler attempted to straighten the nose wheel to facilitate taxiing but was unable to do so because of the nose gear tie-down; the plane director instructed him to remove this tie-down momentarily. The cockpit was empty as the squadron plane captain was in the process of preflighting the aircraft for the next launch. A combination of a ship's roll plus a wet deck caused the aircraft, with its main gear chocks in place, to partially slide into the catwalk. The port main gear went over, breaking the port tie-down, but the starboard gear tie-down held, preventing the aircraft from being lost.

The Accident Board commented that three chain tie-downs, properly positioned, plus wheel chocks, are sufficient for temporarily securing an aircraft during air operations. These requirements are considered to be an absolute minimum.

It is noted that there was no one in the cockpit at the time of the accident. Because of the wet deck and high degree of this one roll, it is uncertain whether a plane captain riding brakes could have prevented the aircraft from skidding over the side. This does not, however, reduce the requirement for a brake rider at any time the tie-down chains are less than the minimum.

It is recommended that:

► All flight deck and hangar deck personnel in-

sure that all aircraft and equipment are properly secured at all times.

► During adverse weather and deck conditions, all ground handling personnel be specifically instructed to exercise extreme caution in the movement of aircraft and equipment.

► It is further recommended that, during periods of heavy deck pitch and roll, one chain tie-down leading inboard from each main gear be attached prior to loosening or removing the nose gear tie-down. This procedure should be followed except when the chains are removed for taxiing or respotting, and is in addition to the brake rider in the cockpit.

That the malpractice noted in this accident is not uncommon is evidenced by this and many other cases of negligent tie-down procedures: At the completion of flight deck respot, an A4D-2 rolled back about 20 feet which allowed its port elevator tip to strike another A4D damaging both aircraft. The plane captain had left the cockpit to complete the securing of the aircraft with the placement of additional tie-downs; thus no one was in the cockpit to hold the brakes, allowing it to roll back.

The Plane Director did not comply with the ship's Instruction which states that a nose tie-down be secured and chocks placed about each main landing gear subsequent to each Aircraft movement on deck. Investigation revealed that a nose tie-down was not used and that the chocks were not about the wheels nor in the vicinity of the aircraft when the accident occurred.

WIRE SNARL—Investigation of two in-flight incidents in which the aft cockpit hinged enclosures of AD-5Ns opened revealed the cause to be due to slack installation of the lockwire connecting safety link, part no. 5433803-25, to aircraft structure at station 220. This condition permitted the hinged enclosure emergency jettison mechanism to operate without actuating jettison control handle. The aircraft received minor damage as a result. It was also discovered that .020" diameter wire was being used where .032" wire is specified. The reporting command stated, "According to the American or Brown and Sharpe Wire Gauge Standard, .032" diameter wire is Gauge No. 20." It is considered a possibility that No. 20 wire, meaning Gauge No. 20 (AWG), may have been ordered and .020" wire delivered.

This possibility is among other booby traps discussed in "Safety Wire Snafu," APPROACH, July 1958. Mechanics should be indoctrinated in the proper application of seal wire, shear wire and lockwire and to order same by specifying material, diameter in thousandths of an inch and by Federal Stock Nos. In this installation the AD-5N HMI specifies brass "lock wire" AN 995B32. However this type and size wire is not available from our supply system. Copper wire, .040" dia., FSN G 6145-236-9491-G327 is the proper substitute.

BuWeps plans to use only the following for materials to reduce the number of misapplications in the future:

► Inconel wire for general lock wiring purposes.

► Aluminum wire for lock wiring purposes when wire is in contact with magnesium.

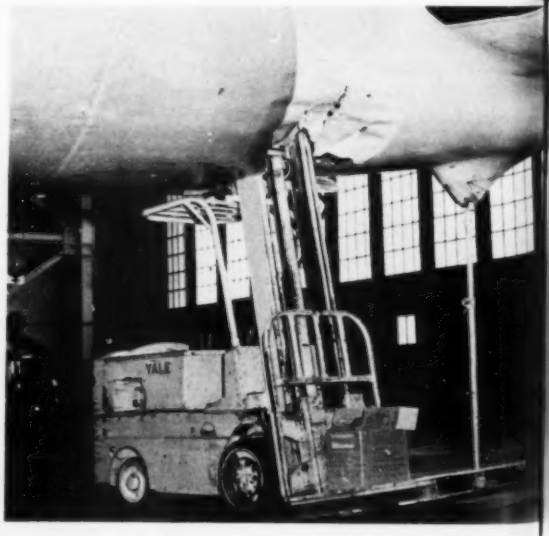
► Copper wire for shear and seal wire purposes only.

The term "safety wire" will be discontinued in favor of the term "lock wire."

For a listing of wire sizes, material and Fed. Stock Nos. please see July 1958 APPROACH.

DID YOU KNOW??—That while much has been said concerning the effects of alcohol on pilots, there is another serious aspect of the problem. Consider the maintenance man trying to do precise work or conducting run-up checks. Could this explain why we sometimes find tools in the tubes or no screws in the skin? Not to mention loose connections, half serviced oxygen systems, hydraulic fires on the line, etc.—*1st MAW "Wingtips"*

This R5D had just undergone an intermediate maintenance check when a forklift was driven into the hangar backward for the purpose of delivering several cans of lacquer. Although there was a completely clear area astern of the R5D 15 feet wide, the forklift driver elected to drive beneath the tail of the aircraft neglecting top side clearance resulting in this accident.



MISSING COTTER PIN—The pilot of an F4D-1 experienced a sudden loss of power while flying a close wing position at 1500 feet circling the field. He pulled up immediately to 2000 feet and noted RPM decreasing rapidly. The pilot retarded throttle, and shortly thereafter the engine flamed out. Two attempted airstarts, one in manual fuel control, were unsuccessful. The fuel boost pump warning light was noted to be ON. At this point, the pilot successfully ejected at 1500 feet, 150 knots airspeed. All safety equipment functioned properly. The pilot was uninjured and was picked up by helicopter. The aircraft received strike damage on contact with trees and the ground.

The Accident Board concluded that:

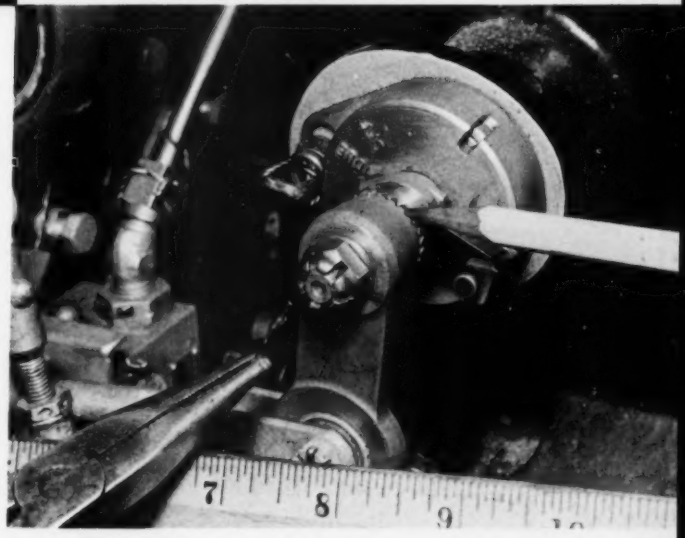
a. The accident was caused by flameout of the engine.

b. The flameout was caused by the absence of the cotter pin which allowed the castellated nut to back off, allowing the throttle linkage to disengage. Vibration caused the fuel control to move to the IDLE setting thus causing misalignment of throttle and fuel control such that the fuel control setting was less than the throttle setting. When the throttle was moved aft, the linkage momentarily re-engaged and the fuel control was thus positioned to OFF.

c. The pilot used correct procedures especially in that he did not wait for a relight but ejected while he still had sufficient altitude.

Recommendations of the Board:

Investigation of the F4D wreckage revealed the cotter pin out and fuel control arm nut backed off allowing control arm serrations to become disengaged from the fuel control.



DANGEROUS ACT—An S2F-1 was tied down aft of the island structure and the engines were operating at approximately 1200 rpm when a plane handler removed the nylon tie-down line from the nose gear. The plane handler then folded the line several times, moved in close to the propeller arc near the starboard side of the fuselage and threw the line low and toward the plane captain who was lying behind the starboard main landing gear. The tie-down entered the propeller arc and approximately 4 or 5 feet of it and the metal hook was propelled into the starboard side of the fuselage. The starboard propeller sustained damage to one blade. Several wires to the aircraft's radar were severed or stripped of insulation.

The plane handler in this mishap erred in that he tried to throw a loosely folded nylon tie-down past the propeller of an operating aircraft.

1) That the following item be added to NavAer 01-40FBA-506, Revision of 1 January 1959, Daily and Preflight Inspection Check Sheet No. F4D-1 Aircraft:

Item No. 25—Inspect engine: (m) Check fuel control linkage for integrity and security. Check 7 cotter pins in the linkage (on both Daily Inspection and Preflight Inspection).

2) That the pilots' standard preflight procedure be amended to include the above item.

3) That a safety-of-flight inspection be developed and added to the Handbook of Inspection Requirements, NavAer 01-40FBA-507, to cover the situation occurring when an aircraft receives major work performed by a different organization.

WATER IN JP-4—The following comments were extracted from a USAF report involving a T-33 accident:

"All aviation fuel inherently contains water. Regardless of how carefully fuel tanks are drained, there will still be a small amount of water present. Condensation will also be present. Maintenance personnel are draining all tanks 30 minutes after the refueling operation and again immediately before the aircraft is flown. This is not always possible however. Some flights are made immediately after the refueling operation. This does not allow sufficient time for water to settle to the bottom of the tank, and draining will not get all the water. Pilots should be made thoroughly aware of the hazards involved in fuel system icing and procedures to follow when operating T-33 (TV) model aircraft at high altitudes.

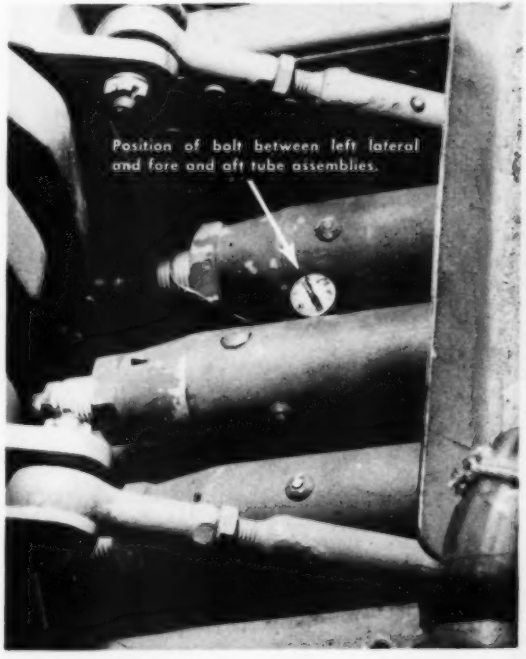
"It is impossible to remove all water from aviation fuel (JP-4) as ¼ pint of free water will be produced for every 500 gallons of fuel when the temperature is reduced from 75°F to —10°F. This may appear to be a very small amount of water, but pilots should understand that only a very small amount of water, in the form of rime ice, ice crystals, snow or slush, is necessary to cause malfunctions in the operation of the main fuel control."

SPARE PARTS—Here's some more old dope which has been previously passed along by ComNavAirPac but in the interest of safety and good maintenance, we are repeating it as the last gasp to those who maybe haven't gotten the word:

It is essential that commanding officers and all personnel responsible for maintenance of aircraft be fully aware of the possibility that a part or assembly drawn from supply stock may not incorporate all latest essential modification, and that *final* responsibility for determining that the part is satisfactory for installation rests with the installing activity.

ComNavAirPac directed commanding officers to institute procedures necessary to insure that prior to installation, assemblies and parts together with associated records and log books, are examined by qualified personnel to determine that essential applicable modifications have been incorporated.

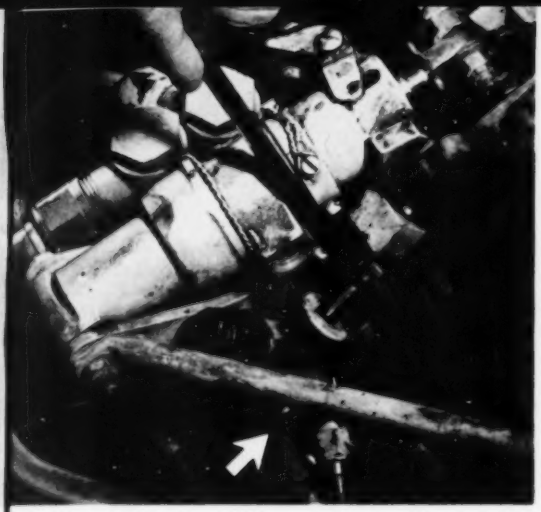
Also, commanding officers having supply departments or aviation storerooms under their cognizance are directed to take such action as is necessary to insure that ready-for-issue spare parts and assemblies have the required modifications incorporated.



AND THERE YOU ARE—Straight and level at 500 feet, the pilot of the HRS noticed an intermittent binding of his cyclic control stick. Considering that the control pressure required was abnormal, his reaction was to shoot a precautionary landing on a handy nearby beach.

Investigation brought to light a stowaway; Bolt; part number AN 25-12. It had worked in between the left lateral and the fore and aft tube assemblies (see photo) which resulted in the binding controls.

This aircraft had been in the hangar for approximately four months and many component parts were changed or repaired during this period of time. Obviously during this time, the trouble-causing hardware went adrift.



"Wing-lock 4-way closed center 4-valve assembly." Pencil points to lock sequence valve which had slipped inboard and prematurely opened causing the accident. Arrow points to bolt head which had loosened.

TRACKER WING TROUBLE—Prior to a catapult launch the S2F's wings had risen about 30 degrees, when the copilot selected the fold position with Spread/Fold Selector handle, following standard procedure. The port wing began to fold but the starboard wing kept moving toward the vertical position. An observer also gave the "fold-wings" signal to the copilot when the observer saw that the starboard locking pins had gone into the locked position. The copilot cycled the selector handle several times but the starboard wing continued spreading past vertical and downward. The engines were secured and simultaneously the wing hinge bolts sheared allowing the wing to sag 15° beyond the fully spread position.

Cause: Nuts loosened on both mounting bolts which attached the "wing-lock 4-way closed center slide 4-valve assembly" to the chassis assembly. This permitted the sequence valve to move inboard and the system operated out of phase, extending the locking pins before the wing outer panel had reached the fully spread position, and prevented the wing from being folded.

Comments and recommendations of the Board:

A. The fact that the nuts had partially backed off the bolts would be difficult to ascertain on preflight inspections due to the inaccessibility of this assembly. A possibility exists that these particular elastic stop nuts may have been used more than once, thus adversely affecting their self-locking property.

B. Standard wing spread procedures were used in this instance.

C. Check the security of the "wing-lock 4-way closed center slide 4-valve assembly" on all inspections.

TRAINING, MANAGEMENT CONTROLS—The fact of involvement of non-rated personnel in ground handling mishaps more than all rated personnel combined is discussed in the USN Aviation Safety Center publication "Ground Handling Accidents" dated September 1959. This is a foreseeable consequence of using predominately non-rated personnel for aircraft ground handling duties. Their less developed sense of responsibility is aggravated by a lack of experience in how to react to responsibility given or assumed. In view of current shortage of rated personnel, continuing and intensive training and more explicit management directions are the two most immediate remedies available. Locally, training has been intensified, while more comprehensive instructions on use of vehicles on aircraft ramps will be published.—*From an accident report*

MAINTENANCE TRAPS — The analysis of an FJ-4 accident involving a nose wheel which would not lower despite the pilot's best efforts contains much food for thought.

This is an excellent example of non-compliance with directives. The HMI clearly states that the grease fitting should be installed upward rather than downward because it will bind on the uplock latch and prevent the door from opening. A check of other aircraft in the squadron revealed some more of these discrepancies. There is little doubt that one of the greatest single causes of material failure accidents is the inability of supervisory personnel to read and comply with maintenance directives. The only insurance that a commanding officer has that the squadron maintenance work is meticulously correct is the knowledge that his supervisory personnel are thoroughly indoctrinated in the use of and are continually refreshed in pertinent maintenance instructions, inspections, and procedures.

There should be rigorous training programs to qualify men to replace the present supervisors. Any lag in the training or breakdown in the inspection system leaves the door wide open for maintenance errors. This is one area where the seriousness of an error is not appreciated. It is too easy to find a failed part in the wreckage and call it material failure as the part is invariably split, or bent, or cracked, or broken. What doesn't show is that the part was installed incorrectly, or overtorqued, or not lock-wired, or not inspected, or bumped, scratched, bruised, or strained because it was near another part being worked on. The point that should never be forgotten is that the "victim" can be any pilot in the squadron. — *1st MAW "Wingtips"*

FOD / MAJOR THREAT

THE major threat to jet engine operation continues to be Foreign Object Damage. If fatal air crashes and costly engine overhauls from this cause are to be reduced, all hands must wholeheartedly cooperate in keeping aircraft ducts, parking aprons, taxiways and runways free of damaging material.

It costs the government about $7000.00 to overhaul each engine suffering from foreign object damage. It has been determined that a large number of J-65 engine changes due to foreign object damage is caused by foreign objects such as cotter pins, washers, bolts, lock-wire and other small metallic pieces, remaining in the engine bay after conducting 60-hour inspection, which require removal of the engine. These can be sucked into the engine at low speeds. Similarly, acrobatic maneuvers can cause these objects to fall into the engine. At one time five envelopes full of such foreign matter were removed from the aircraft of one squadron during a meticulous clean-up. Another time two cups filled with miscellaneous material (nuts, bolts, washers, lock-wire, etc.) were removed from the plenum chamber of an FJ aircraft undergoing interim rework.

A major jet base recently revealed that a great many of the pad eyes were found full of gravel, pieces of concrete, sand, and metal. This was in spite of a periodic cleaning of the ramps with a rotary sweeper. Other reports from Pacific Fleet carriers revealed that prior to scheduled flight operations that the majority of pad eyes on the flight deck each contained enough debris to cause foreign object damage to several jet engines. An investigation by the National Advisory Committee for Aeronautics revealed that vortices formed at the duct inlet are more likely to pick up loose foreign objects from cracks (or pad eyes) than from a smooth surface. All hands should remember that a conscientious and effective effort to keep operation areas free of damaging material and air ducts clean is the most effective preventive action.

There is a very great need for a "clean up" campaign on parking ramps, taxi strips, high power run-up areas and runways. An equally important campaign is needed to ensure that tools, nuts, bolts, cotter pins, washers and bits of lock-wire are removed from plenum chambers, as well as in and adjacent to intake and cooling air ducts. It also should be emphasized that aircraft which have been idle for a period of time or that have had work performed on them must be carefully inspected prior to initial turn-up. This is especially significant since available data indicated that foreign object damage aboard aircraft carriers is approximately the same as ashore.

The following procedures should be followed by all hands to lessen the possibility of foreign object damage.

1. If a vacuum cleaner is available, vacuum the entire internal fuselage section at least every 60-hour check and every time the tail is removed.
2. Personnel should be cautious about dropping anything into the fuselage particularly the area around the engine.
3. Make a thorough check, after all maintenance is accomplished, to account for all tools and parts used or replaced.
4. Inspect to determine that all cowlings and inspection doors are secured and loose parts removed from the engine ducts before an engine is operated.
5. Use care and caution when running an engine. Use no more power than necessary. This can reduce the suction power of the engine.
6. Pick up any debris found on the parking ramp, run-up area, and on the runways.
7. Never wear loose clothing or carry rags or gloves in pockets while walking around engines in operation.
8. Install intake screens if available during ground run-up.

In conclusion the final analysis seems to be that clean ramps, turn-up areas, and aircraft, coupled with careful maintenance will decrease the number of foreign object damage to engines.—*VA-63*

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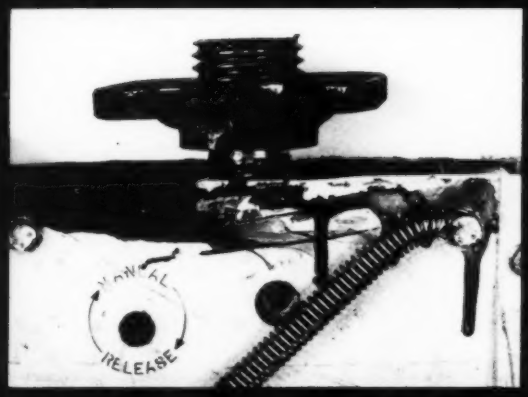
MURPHY'S LAW*

* If an aircraft part can be installed incorrectly, someone will install it that way!

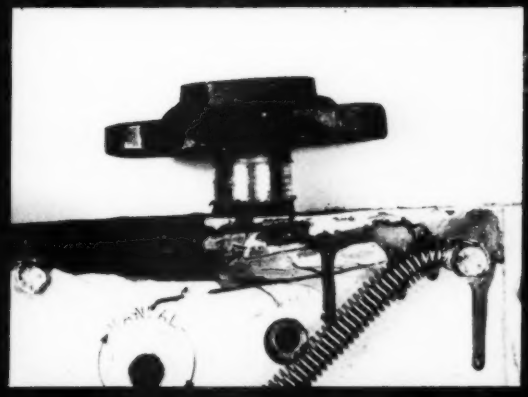
HERE is a classical example of a Murphy. A mounting plate for a modified Aero 14B-2 bomb rack was installed upside down because an ordnanceman thought the plate was not secure enough when installed correctly. The bomb rack is used on the F9F for air-to-air banner towing and is installed by use of the catapult hold back ring.

As a result of this incorrect installation the rack worked loose during a towing mission and canted about 45 degrees pulling the electrical connection from the fuselage receptacle. Release of the tow cable became impossible. As the flaps were lowered for landing the starboard inboard flap was damaged when it contacted the off-center bomb rack. The F9F landed with the tow banner without incident.

Because design symmetry led the ordnanceman into a maintenance trap the reporting squadron is modifying all mounting plates as shown in bottom photo.



Upside down mounting plate allowed attaching bolt to protrude above the plate allowing the rack to work loose and cant.



Correct method of installation of bomb rack mounting plate.

Modified mounting plate.

SCATTERED squalls blew across the sky above the heaving Atlantic . . . sea state FIVE, 12-foot waves and a 47 knot relative, 37 knot true wind. The carrier was refueling from an oiler on the starboard side. On the port side, a destroyer was at the after high line station with her bridge even with the LSO platform on the carrier. (A second destroyer was trailing as rescue ship.)

The destroyer was preparing for a high line transfer of a man who had sustained a serious head injury when thrown against a gun turret by high seas. Decision to transfer the man from the destroyer to the carrier by high line instead of helicopter had been made because of rotor-engagement limitations on the helicopter. The carrier was unable to turn out of the high winds because of the refueling operation in progress.

Suddenly, as the high line transfer was underway, the line parted and the injured man dropped into the sea.

"I was standing near the island structure and looking aft," the rescue pilot said later, "when I saw one of the helo pilots who was observing the high line transfer from the LSO platform start running towards me and very rapidly giving the 'turn-up' signal. Assuming the worst, I ran for the helo which was booted on the number one elevator and commenced an immediate start. I made the decision to attempt rotor engagement beyond published safe limitations because of several factors: 1) the man in the water was already known to be seriously injured; 2) the wind was known to be seven knots above limits and moderately steady and with our clutch set for minimum engagement time of eight seconds I fully expected a safe engagement; and 3) rescue of the man in the water would be difficult for the destroyer because of the 12-foot waves. As the crew removed the last boot, the carrier began sounding her horn and passed the word MAN OVERBOARD."

When the pilot was given the green flag from the helo crew, he applied maximum allowable power which he maintained until

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the helicopter was over the man in the water—one minute after takeoff.

The man in the water was wearing an orange kapok-filled life preserver. He was readily visible from the air in spite of the 12-foot waves. The helo pilot entered a high hover, higher than usual because of the seas, but less than normal power was needed because of the wind.

The three-pronged rescue seat was lowered to the injured man. At first he stood on the prongs and grasped the hoist cable above the hook but in response to the crewman's signals, he sat down on the seat. His condition seemed fair. Although slightly dazed and bleeding from the wound on his head which had been bandaged prior to the high line transfer, he was able to assist in his rescue and was hoisted aboard. (Later, x-ray examination revealed a skull fracture.)

The helicopter returned to the carrier; total flight time, seven minutes. The injured man was in the water only two minutes.

In an interview later, he stated that although he had been at sea 12 months aboard the destroyer, he had never before seen the helicopter rescue seat or a picture of it. Sitting down on the seat had not occurred to him until he was signaled to do so. He had read the words ABANDON CHUTE on the seat as soon as it was lowered to him, he said. The rescue pilot suggests that perhaps the words SIT DOWN with an arrow pointing down would be a useful addition to the seat for the benefit of survivors who are not familiar with this means of rescue. ●

Three hundred of the three-pronged helicopter rescue seats have been purchased by the Navy for distribution through the aviation supply system. Helicopter squadrons should draw the seats under stock number RH1680-673-5679-LA20.

Guarantee

During such period as it remains neatly stowed in the gear locker, the survival equipment issued for the protective use of the airman is unconditionally guaranteed to provide absolutely no protection for anyone.